COMMONWEALTH BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 28] August, 1958 [No. 8

DISEASES CAUSED BY BACTERIA AND FUNGI

WAHBY, A. M. & NASR, S. (1957). **A rapid laboratory method for diagnosis of bovine mastitis.** — *Zbl. VetMed.* **4**, 341-358. [In English. Summaries in French, German and Spanish.] **2380**

Of 440 samples of milk, 320 from buffaloes and 120 from cows, 100 proved to be from mastitis cases. These 100 samples had, on the average, a slightly higher pH and chloride content and a much higher total cell count than the samples of normal milk. But the main difference was the presence of true polymorphs and occasional monocytes in mastitis milk and their complete absence in normal milk. It is recommended that, in routine preliminary tests for mastitis, samples of fore-milk should be stained by Skar's (1926) method and examined for the presence of polymorphs.—M.G.G.

MOLLER, K. (1957). **The control of *Streptococcus agalactiae* mastitis by milking-shed hygiene, with particular reference to hibitane: a preliminary report.**—*N. Z. vet. J.* **5**, 79-83. **2381**

The results are reported of an attempt to control *Str. agalactiae* mastitis by improved milking shed hygiene in 23 herds in which 34% of the cows were infected. The measures suggested were: (1) making running water available in each bail in a shed, (2) keeping the sheds clean, (3) non-use of greasy teat ointments, (4) cleaning of the udders and teats with disinfectant solution before milking, (5) dipping the teat cups in disinfectant after milking each cow, (6) keeping the milkers' person clean, and (7) milking infected cows last. These recommendations were carried out to a reasonable degree for a year in 11 of the herds, in one of which the disinfectant "Hibitane" (chlorhexidine) was used continuously. In the 7 herds practising excellent or good hygiene, the infection rate fell steadily to 5–10% at the end of a year, whilst in the 4 practising fair to poor hygiene, the rate after an initial drop to 2–15% has increased again to 10–20%. Hibitane in a 0·5% soln. had a marked effect in reducing the infection rate.

A. ACKROYD.

VICKERS, H. R., BAGRATUNI, L. & ALEXANDER, S. (1958). **Dermatitis caused by penicillin in milk.** — *Lancet* February 15th, 351-352. [Authors' summary modified.] **2382**

Two cases in man are reported of allergic dermatitis due to penicillin in milk from cows treated for mastitis. One sample of milk contained 4 units of penicillin per ml. It is suggested that the American ruling prohibiting the sale of milk from cattle for 72 hours after the last injection of penicillin should be adopted in Gt. Britain.

OBIGER, G. (1957). Über Pigmentbildung bei Gruppe B-Stämmen (Sc. agalactiae). [**Pigment formation in Group B strains of *Streptococcus agalactiae.***] — *Milchwissenschaft* **12**, 422-430. [English, French and Spanish summaries.] **2383**

Six pigment-forming strains of Group B *Str. agalactiae*, three from milk and three from man, were studied. Optimum temp. for pigment production was about 37°C. These strains required either starch or serum, but not oxygen. The pH of the medium and the presence of proteins and minerals appeared to have no effect on pigment production. The chemical structure of the pigment was not determined.—E.G.

EVANS, E. T. REES. (1957). **Bacterial endocarditis of cattle.**—*Vet. Rec.* **69**, No. 49. Pt. 2. pp. 1190-1202. Discussion: pp. 1202-1206. **2384**

Based on the histories and P.M. examination of 40 cattle, data are reported on the incidence and clinical features of bacterial endocarditis in cattle, its pathology, the results of bacteriological examinations of blood during life, and of haematological and urine examinations.

Records at knackeries in the south-west of Wales indicated an estimated annual crude mortality rate of 5·2 per 10,000 head at risk, but veterinary surgeons' records from the same area suggested a crude morbidity rate of only 0·31. This marked discrepancy is probably due to difficulty of diagnosis during life. Lesions were

divisible into 2 main classes: embolic phenomena, and heart failure. Vegetations most frequently involved the tricuspid valve, but 61·1% had lesions in both sides of the heart. The majority of vegetations yielded α- or non-haemolytic streptococci, of which the 16 examined belonged to Group D, but a few yielded pyogenic bacteria. A primary focus was not apparent in the majority, but there was a suggestion of an association between fascioliasis and endocarditis. Clinical observations on 3 cases were described in discussion on the paper.—A. Ackroyd.

Mohiyuddeen, S. & Krishna Rao, N. S. (1958). **An epidemic of cutaneous anthrax among bovines in North Kanara district (Mysore State).**—*Indian vet. J.* **35,** 55-63. **2385**

An outbreak of cutaneous anthrax was encountered in cattle and buffaloes in dense forest areas of the Western Ghats, where blood-sucking flies were prevalent; and *B. anthracis* was claimed to have been found even in smears made from the mouthparts of such flies caught while biting the affected animals. Skin lesions were also observed in some in-contact human beings.—R. N. Mohan.

Beinhauer, W. (1958). Katzen als Überträger der Tuberkulose im Rinderstall. **[Cats as carriers of tuberculosis in the cowshed.]** — *Dtsch. tierärztl. Wschr.* **65,** 271-273. [Summary in English.] **2386**

Severe TB. caused by bacilli of bovine type was found in 2 farm cats. There had been positive reactors to a recent tuberculin test of cattle on the farm, after 3 years' freedom from TB. —R.M.

Mukherji, A. & Chatterjee, D. P. (1958). **On the finding of a tubercle bacillus, morphologically resembling the vole bacillus, in binturong (*Arctictis binturong* Raffles).** — *Indian vet. J.* **35,** 108-111. **2387**

The authors described the morphology and staining characters of the organisms seen in films and sections from caseating nodules in formalin-preserved spleen, lungs, liver and kidneys of a civet-like carnivorous 'bear cat' which had died in the Calcutta zoo.—R. N. Mohan.

Meyn, A., Schliesser, T. & Schrinner, E. (1957). Zur Frage der Standardisierung des Einheitstuberkulins. **[Standardization of tuberculin.]** — *Rindertuberkulose* **6,** 69-74. **2388**

The authors refuted the suggestion of Seelemann & Wegener [*V.B.* **27,** 1336] that reactions to various standardized tuberculins depended on pH of the tuberculin. The reaction did not vary whether pH was 6 or 7·2; the causes of variation were to be found in slight differences in injection and measurement technique and in differences between individual animals.—R.M.

Ianev, E., Ogneanov, D. & Haralambiev, H. (1957). **[Action of strychnine on the ophthalmic tuberculin reaction in cattle.]**—*Anu. Inst. Serui Vaccin. Pasteur Bucuresti* **2,** 425-433. [In Roumanian. Summaries in French, German and Russian.] **2389**

Sensitivity of cattle to the ophthalmic tuberculin test was greatly increased if 3 ml. of 0·5% strychnine nitrate was inj. s/c 30 min. before the test. It was claimed that the number of positive reactions obtained in strychnine-treated animals was 12 times the number obtained in untreated cattle in the same herds. Post-mortem examinations were not done to confirm the test results, but it was stated that tuberculin-negative animals remained negative when re-tested after strychnine administration.—R.M.

Messerli, W. (1957). Atypische Tuberkulinreaktionen beim Rind. Ein Beitrag zu ihrer Abklärung durch intrakutane Injektion von Extrakten aus säurefesten Saprophyten. **[Atypical tuberculin reactions in cattle.]** — *Schweiz. Arch. Tierheilk.* **99,** 287-309. [Summaries in English, French and Italian.] **2390**

Non-specific reactions may occur in up to 10% of cattle undergoing the tuberculin test, and no completely reliable method of resolving these reactions has been found. Comparative tuberculin tests were carried out in 223 non-specific reactors with mammalian and avian tuberculins and a tuberculin prepared from cultures of *Mycobacterium rabinowitsch* grown on Sauton medium and sterilized at 100° C. On the whole the "Rabin" tuberculin produced smaller increases in skin thickness than mammalian and avian tuberculins in cattle that in later tests proved to be positive, and produced larger increases than the other two tuberculins in cattle that later proved to be free from TB. It is recommended that cattle giving non-specific reactions to mammalian tuberculin should also be tested with avian and "Rabin" tuberculins. If the "Rabin" reaction is stronger than or within 1 mm. of the tuberculin reaction the animal can be regarded as free from TB. If the tuberculin reaction is over 1 mm. stronger than the "Rabin" reaction the animal should continue to be regarded as doubtful. The method is considered to be about 90% reliable.—M.G.G.

Nassal, J. (1957). Das Ergebnis planmässiger Milchuntersuchungen bei Kühen mit positiver

Tuberkulinreaktion. [**Results of regular examination of milk from cows reacting to the tuberculin test.**]—*Rindertuberkulose* **6,** 55-69. **2391**

Tubercle bacilli were identified by microscopy or animal inoculation in 1,203 of 108,000 milk samples from cows reacting to the tuberculin test. In about half the cows yielding infected milk, there was no clinical evidence of mammary TB. Pathological and bacteriological examinations of udders from cows giving infected milk were negative in 5·7% of cases. This served to stress the possibility that tubercle bacilli could be excreted through a normal udder, and also the value of milk examination in preventing human infection.—R.M.

KURUNG, J. M. (1957). **The examination of sputum. I. Collection and selection. II. Search for elastic tissue. III. Search for fungal spores.**—*Amer. Rev. Tuberc.* **76,** 671-674; 675-678 & 679-682. **2392**

For the diagnosis of pulmonary disease purulent or mucopurulent sputum is required, the purulent portion being teased out from the latter type for examination. Preliminary gross inspection may show granules of *Actinomyces* or *Nocardia*. A small speck of unstained sputum mixed with a drop of 10% NaOH should be examined for elastic fibres, the presence of which indicates destructive pulmonary disease, particularly TB. Unstained and stained preparations may reveal *Actinomyces bovis, Nocardia asteroides, Blastomyces dermatitidis, Coccidioides immitis, Cryptococcus neoformans, Candida albicans,* or *Histoplasma capsulatum*. Typical findings are illustrated in plates, based on the author's experience over some 30 years in a tuberculosis hospital.—E. G. WHITE.

BOJALIL, L. F., PÉREZ-TAMAYO, R. & BASTARRACHEA, F. (1958). **Persistence of tubercle bacilli in the organs of guinea pigs under chemotherapy.**—*Amer. Rev. Tuberc.* **77,** 473-481. [Summaries in French and Spanish. Authors' summary modified.] **2393**

Guinea pigs infected with tubercle bacilli and treated from the day of infection with isoniazid and streptomycin for 15 and 30 days showed fewer lesions the longer the treatment was continued. A similar group of animals treated for 60 days failed to show any morphological evidence of TB. at the end of treatment. 240 days after discontinuation of treatment, however, lesions appeared which were limited to the lymph nodes.

Different g.pigs subinoculated with one of several organs of animals treated for 15 and 30 days developed TB. When subinoculation was carried out in the same manner with macerates of organs of animals treated for 60 days, no evidence of TB. was present despite the fact that the subinoculated g.pigs became tuberculin positive.

ALTEVOGT, R. (1957). Untersuchungen über gleichzeitiges Vorkommen verschiedener Typen von Mycobacterium tuberculosis und nachfolgender Typendifferenzierung. [**Simultaneous occurrence of the different types of tubercle bacilli and the differential typing of mixtures of types.**]—*Z. Immunforsch.* **113,** 472-476. **2394**

Sixty g.pigs were injected with mixtures of human- and bovine-type tubercle bacilli in proportions of 5:95, 25:75, 50:50, 75:25, and 95:5, and tubercle bacilli were recovered from their organs by culture on Hohn and Kirchner medium. Two rabbits were injected s/c with organ pulp from each g.pig. Since rabbits are susceptible to the bovine type only, bovine type infection was produced in all those injected with material from g.pigs which had been infected with mixtures containing at least 25% of bovine-type bacilli. If only 5% of one type of tubercle bacilli was present in the mixture used for infection, it failed to grow in selective media.—E.G.

LURIE, M. B., ZAPPASODI, P., LEVI, R. S. & BLAKER, R. G. (1958). **Role of thyroid in native resistance to tuberculosis.**—*Fed. Proc.* **17,** 447. **2395**

Resistance of rabbits to experimental pulmonary TB. was enhanced by prior administration of L-triiodothyronine. Hypothyroidism reduced resistance.—R.M.

BERTHRONG, M. & HAMILTON, M. A. (1958). **Tissue culture studies on resistance in tuberculosis. I. Normal guinea pig monocytes with tubercle bacilli of different virulence.**—*Amer. Rev. Tuberc.* **77,** 436-449. [Summaries in French and Spanish. Authors' summary modified.] **2396**

Tissue culture experiments were carried out with normal g. pig monocytes infected with various strains of tubercle bacilli. As previously reported by others, virulent bacilli destroyed the monocytes more rapidly than attenuated bacilli and were able to multiply intracellularly in the surviving cells at a more rapid rate. Heavy infection levels of attenuated bacilli had the same effect on normal monocytes as light infections by virulent organisms.

The most severe effect of all bacilli on cells occurred within the first 48 hours. This initial

cell death appeared to be the result of a "toxic" effect of relatively small numbers of intracellular bacilli. Thereafter, even with virulent organisms, some monocytes survived and migrated well with large numbers of intracellular multiplying tubercle bacilli. The final death of such cells in tissue culture seemed to be a consequence of mechanical "bursting" of the cell.

CITRON, K. M. (1958). **Tissue culture studies of tuberculin hypersensitivity in man.** — *Tubercle, Lond.* **39,** 65-75. [Author's summary modified.] **2397**

Tuberculin hypersensitivity in man has been investigated by observing the effect of tuberculin upon the migration of human leucocytes in tissue culture *in vitro*. Leucocytes from tuberculin insensitive control subjects were unaffected by tuberculin. The migration of leucocytes from patients with pulmonary tuberculosis was diminished by tuberculin. The degree of sensitivity of leucocytes to tuberculin *in vitro* was correlated with the clinical condition of the donor patient. In general leucocytes from patients with acute and extensive disease, cavitation, fever and high erythrocyte sedimentation rate were more sensitive *in vitro* than leucocytes from patients with chronic disease.

The sensitivity of the skin to tuberculin as indicated by the Mantoux test was correlated with *in vitro* leucocyte tuberculin sensitivity. The *in vitro* leucocyte sensitivity correlates better with clinical evidence of activity of tuberculous disease than does the Mantoux test. Leucocytes from sarcoidosis patients whose skin did not react to tuberculin were uniformly insensitive to tuberculin *in vitro*.

PROKHOROV, A. V. & AKULOV, A. V. (1958). **[Diagnostic value of the whole-blood agglutination test in avian tuberculosis.]**—*Veterinariya, Moscow* **35,** No. 2. pp. 45-48. [In Russian.] **2398**

The organs of 109 fowls, negative to the tuberculin test but positive to the whole blood agglutination test, were examined microscopically, culturally and histologically. Tubercle bacilli were seen in 49 fowls, usually in smears from the liver, and sometimes from the spleen, but also from the ileo-caecal tract (12 birds), kidneys (4), and ovary (2). Cultures of tubercle bacilli were obtained from 36 birds. Typical changes were seen histologically.—M.G.G.

PARLETT, R. C. & YOUMANS, G. P. (1958). **Antigenic relationships between ninety-eight strains of mycobacteria using gel-diffusion precipitation techniques.** — *Amer. Rev. Tuberc.* **77,** 450-461. [Summaries in French and Spanish. Authors' summary modified.] **2399**

By means of an agar double-diffusion precipitation technique and using viable mycobacterial cell suspensions as a source of antigen, 98 strains of mycobacteria were divided into eight antigenic groups.

Group I comprised 64 cultures. Nineteen of these were typical strains of human type tubercle bacilli, 42 were "atypical" acid-fast cultures, the remaining 3 were the avian strain Kirchberg and the strains *M. balnei* and vole.

Group II comprised 5 "atypical" acid-fast cultures, 4 known bovine strains, and the avian strain Sheard. Group III contained some of the saprophytic mycobacteria and the strain *M. ranae*. Group IV consisted of 3 strains of *M. phlei*; Group V three "atypical" acid-fast strains, a single recently isolated *M. tuberculosis* var. *hominis*, and *M. ulcerans*; Group VI only 2 "atypical" acid-fast strains. Group VII was similar to Group IV in that only a single species was represented, *i.e.* three strains of *M. fortuitum*. Three "atypical" strains and *M. marinum* were placed together in Group VIII. This is not a true group, however, as each culture formed a precipitate only with homologous antiserum.

SEIBERT, F. B. (1958). **Isolation of an important immunologically active tuberculopolysaccharide.**—*Fed. Proc.* **17,** 308. **2400**

Two types of tuberculopolysaccharide found in culture filtrates of tubercle bacilli grown on synthetic media can be quantitatively distinguished by the orcinol and anthrone colour reactions, since Type I predominates in arabinose and Type II in glucose. Tuberculopolysaccharide was isolated from the culture filtrate of a human strain of tubercle bacillus from which the major proteins had been removed by saturation with ammonium sulphate. From the brown residue the two polysaccharides were separated by electrophoresis. These polysaccharides are immunologically important although they do not give a skin reaction in sensitized animals. Type II is antigenic, while Type I is a haptene able to interfere with complement fixation and precipitation of immune sera by tuberculin protein, and also with the bacteriostatic effect of normal and immune sera. It shows its antigenic effect *in vitro* in high dilution compared with protein, and can, in excess, resolve its antigen–antibody complexes. Moreover, when injected into sensitized animals it causes antibodies to disappear from the serum.—R.M.

ECKMAN, P., KING, W. & BRUNSON, J. (1958). **Effect of endotoxin on the blood brain barrier.** —*Fed. Proc.* **17,** 435. [Authors' abst. modified.] **2401**

Rabbits were given a single injection into the carotid artery of Gram-negative endotoxin (50 μg.) followed at varying intervals by an intracarotid inj. of 2 ml. of trypanblue, Evans blue, colloidal iron or a combination of iron and one of the blue dyes. Another group was given an i/v inj. of 2 ml. of 2% fluorescein at varying intervals after an intravenous or intracarotid inj. of 50 μg. of endotoxin. In those given endotoxin and one of the colloidal substances, about 60% showed diffuse gross staining of the brain when the interval between the injections of toxin and dye was 4 hours. The incidence of penetration of the blood–brain barrier, as manifested by gross staining of the brain, decreased to 13% when the interval between toxin and dye was only 1 hour, and to nil when the interval was 12 hours. In the group given fluorescein, the greatest incidence of fluorescence of the brain occurred when the interval between i/v inj. of toxin and dye was 8–12 hours. Dye was observed microscopically in the lumina and walls of the vessels, and in phagocytes and neurones. The vascular lesions were associated with the presence of subendothelial hyaline fibrinoid material, similar to that which characterizes the lesions of the generalized Shwartzman phenomenon. Preliminary studies suggest participation of adrenal gland secretions in alterations in permeability of the cerebral vessels.

ANAYA, J. S. (1957). El chlorhidrato de oxitetraciclina (terramicina) en el tratamiento de la linfangitis ulcerosa. **[Treatment of ulcerative lymphangitis in horses with oxytetracycline.]** — *Rev. Vet. Milit., B. Aires* **5,** 99-110. **2402**

An aqueous soln. of oxytetracycline was injected subcutaneously at several points around the ulcers. For each treatment 250 mg. were dissolved in from 50 to 100 ml. water. 26 horses were treated and 21 recovered, some after one treatment and others after 2, 3 or 4 treatments. —R.M.

LODENKÄMPER, H., FISCHER, M. & NICKEL, H. (1957). Über die klinische Bedeutung und Differentialdiagnose der anaeroben Corynebakterien. **[Clinical importance and differential diagnosis of anaerobic corynebacteria.]**—*Z. Hyg. InfektKr.* **143,** 467-479. **2403**

Biochemically and morphologically there was little or no difference between any of ten strains of anaerobic Gram-positive corynebacteria and one aerobic strain. Deviations from the antigenic structure were observed in strains of the same type, and different types had common antigens.—E.G.

STEHLIK, Z. & ZARZYCKI, J. (1958). Wpływ malleinizacji dospojówkowej na wiązanie dopełniacza u koni poddanych próbie śródskórno-powiekowej i podskórnej). **[Effect of the conjunctival mallein test in horses on subsequent intradermo-palpebral and subcutaneous mallein tests, and on complement fixation.]**—*Méd. vét., Varsovie* **14,** 5-10. [In Polish. Summaries in English and Russian.] **2404**

32 army horses which underwent the conjunctival mallein test twice a year, for several years, were divided into 2 groups and subjected to intradermo-palpebral and subcutaneous mallein tests respectively. Subsequently no evidence of glanders complement-fixing antibodies could be found in the blood of these animals. The authors are of the opinion that carrying out of the conjunctival mallein tests over a long period of time induced in the horses an adaptation to mallein.—M. GITTER.

SÄRING, H. (1957). Experimentelle Studien zur Pathogenese der Listeriose. **[Experimental study of the pathogenesis of listeriosis.]**—*Mh. Tierheilk.* **9,** 201-206. **2405**

S. reported an outbreak of listeria infection on a large chinchilla farm. Experimentally 4 chinchillas were infected by the oral administration of 1 ml. broth culture of the organism and died 5–8 days after infection, while g.pigs given the same dose of culture remained healthy. Similarly, i/p infection was rapidly fatal for chinchillas but did not affect g.pigs.

Inoculation of formolized cultures of listeria did not immunize chinchillas against infection with the homologous strain of organism.—R.M.

SACQUET, E. (1957). Une *Pasteurella* nouvelle isolée d'abcès pulmonaires du rat blanc. **[A new pasteurella isolated from pulmonary abscesses in a white rat.]**—*Ann. Inst. Pasteur* **93,** 800-803. [Summary in English.] **2406**

The isolated organism differed from *Past. septica, haemolytica* and *pseudotuberculosis* in its biochemical properties, and differed from *Past. purifaciens* in colony morphology. S/c inoculation of cultures of the organism caused large abscesses. I/p inoculation of rats and mice with 0·5 ml. culture provoked multiple mesenteric abscesses and death within 6 or 7 days. The organism was only weakly pathogenic for g.pigs and rabbits.—R.M.

WEISS, K. & HOCHFELDT, I. (1957). Über die bakterizide Wirkung von Polymyxin B sowie Terramycin-Polymyxin auf *Bact. pyocyaneum* (*Ps. aeruginosa*). [**Bacterial action of polymyxin B alone or combined with oxytetracycline on** *Ps. pyocyanea.*] — *Zbl. Bakt. I.* (*Orig.*) **169,** 415-424. **2407**

The bactericidal action of these antibiotics *in vitro* varied from strain to strain of *Ps. pyocyanea,* but it was concluded that there was little chance of the organism being killed in bull semen by the addition of polymyxin with or without other antibiotics, in concentrations currently employed. Because such additives might damage spermatozoa, the authors warned against their use.—R.M.

CIAK, J. & HAHN, F. E. (1958). **Mechanisms of action of antibiotics. I. Additive action of chloramphenicol and tetracyclines on the growth of** *Escherichia coli.*—*J. Bact.* **75,** 125-129. [Authors' summary modified.] **2408**

Chloramphenicol, chlortetracycline, and oxytetracycline in sub-bacteriostatic concentrations had an additive effect on the growth rate of *E. coli.* Equimolar concentrations of chlortetracycline and oxytetracycline elicited nearly identical growth-inhibitory effects while molecule for molecule, chloramphenicol was about 5 times less active. The mechanisms of action of the two tetracyclines are considered to be identical. The additive effect of chloramphenicol and tetracyclines is interpreted as concurrent blocking of different metabolic pathways contributing to protein synthesis.

BERNSTEIN, A. (1958). **A new phage type of** *Salmonella paratyphi B* **which was responsible for an outbreak of food poisoning.** — *Mon. Bull. Minist. Hlth Lab. Serv.* **18,** 92-96. [Author's summary modified.] **2409**

A large outbreak of food poisoning was caused by a new phage type of *S. paratyphi B,* designated type Worksop. The phage for the new type is a phenotypic modification of paratyphoid B phage 3b. All except 8 of 161 cultures received were typable by the new phage, but evidence suggests that these 8 were also from the epidemic. The same phage type was subsequently isolated from two other smaller outbreaks. In each outbreak the suspected vehicle of infection was a pork product. Five cultures of the same type were also isolated from animal feeding stuffs. No cases of enteric fever due to this type have been noted.

HILL, C. H. & GARREN, H. W. (1958). **Plasma ascorbic acid levels of chicks with fowl typhoid.**—*Poult. Sci.* **37,** 236-237. **2410**

The concentration of ascorbic acid in the plasma of chicks fell after experimental infection with *Salmonella gallinarum,* but the fall was not so great in infected chicks fed ascorbic acid as 0·1% of the diet. Mortality, however, was similar in both groups.—M.G.G.

HILL, C. H. & GARREN, H. W. (1958). **Effect of dietary protein levels on susceptibility of chicks to fowl typhoid.**—*Fed. Proc.* **17,** 479. [Authors' abst. modified.] **2411**

A soya bean meal-cerelose diet, supplemented by adequate quantities of vitamins, minerals and methionine, was used. The soya bean meal was the sole source of protein in the diet. Day old chicks were fed this diet made up to contain 10, 20, and 30% protein for 4 weeks before inoculation with *S. gallinarum* and continued on these diets until the experiment was terminated, 15–18 days after inoculation. Forty to 60 chicks were used for each treatment in each of the 4 experiments. The number of survivors and the average survival time decreased as the protein level was increased. The increased susceptibility with increased levels of protein occurred whether the organism was inoculated orally or intramuscularly, and whether the energy value of the diets was allowed to vary or was held constant. In an experiment comparing casein with soya bean meal, increased protein from either source increased the susceptibility of the chick to fowl typhoid to the same extent.

BRILL, J. & GOŁĘBIOWSKI, S. (1957). Kompleksowe środowiskowe badania brucelozy. [**Environmental investigations in brucellosis.**] —*Rocz. Nauk rol.* Ser. E. **68,** 93-120. [In Polish. Summaries in English and Russian.] **2412**

The incidence of brucellosis was investigated on a brucella infected farm and its environment. On serological examination of 50 adult cattle 31 were positive and 3 doubtful; of the 35 young cattle 4 were positive and 2 doubtful; of 29 horses 2 were positive and 4 doubtful, and of 47 pigs 18 were positive and 18 doubtful. 2 out of 12 men and 2 out of 3 farm dogs also gave positive reactions. Blood samples of 29 hares shot in the neighbourhood were negative. *Brucella abortus* was recovered from cattle and *Br. suis* var. *thomseni* from pigs. The results of the complement-fixation and agglutination tests often differed and the authors suggest that the two tests should be carried out simultaneously. Old standing infections more often give positive results to the c.f. than to the agglutination test while in recent infections the two tests appear equally sensitive.—M. GITTER.

LUTYŃSKI, R. (1958). Bruceloza wśród pracowników służby weterynaryjnej województwa krakowskiego. **[Brucellosis in veterinary personnel in Cracow.]**—*Méd. vét., Varsovie* **14,** 72-76. [In Polish. Summaries in English and Russian.] **2413**

Serological examinations involving rapid and tube agglutination tests, complement fixation and modified Coombs tests were carried out on blood samples of 219 people. 49·9% were found infected, with 5·9% showing clinical symptoms. The highest number of positive reactions was obtained with the Coombs test; in infections of long standing the complement-fixation test often gave negative results while the rapid agglutination test appeared to be more sensitive than the tube test.—M. GITTER.

VAN DER SCHAAF, A. & JAARTSVELD, F. H. J. (1958). De invloed van het bewaren van melk bij + 4°C. gedurende één of meer dagen op de A.B.R. **[Influence of one or more days' storage of milk at 4°C. on the brucella ring test.]** — *Tijdschr. Diergeneesk.* **83,** 291-295. [In Dutch. Summaries in English, French and German.] **2414**

Milk was repeatedly examined from 7 cows artificially infected with *Br. abortus* during pregnancy. The first milk gave less intense or negative reactions to the ring test, particularly when examined soon after milking. With these and pail samples clearer results were obtained after storing the milk for 24 hours in a refrigerator: some samples which gave a negative reaction when fresh became positive after storage. —R.M.

VAN DRIMMELEN, G. C. (1958). **The *Brucella* vortex aeration culture apparatus.** — *Appl. Microbiol.* **6,** 40-41. **2415**

An account of the apparatus used for the production of *Br. abortus* Strain 19 vaccine at Onderstepoort. The culture vessel has a capacity of 250 ml. [See also *V.B.* **27,** 2930.]—R.M.

KILCHSPERGER, G. (1957). Schutzimpfung mit Buck 19; Abhängigkeit des Titerverlaufs von der Keimzahl des Impfstoffes. **[Vaccination with Strain 19: dependence of the titre curve on the number of bacteria in the vaccine.]**—*Schweiz. Arch. Tierheilk.* **99,** 509-515. [Summaries in English, French and Italian.] **2416**

Of 28 calves, each vaccinated with a dose containing 50×10^9 Strain 19 brucella, one still had a titre of 1:80 a year later. Of 30 calves vaccinated with a dose of $37{\cdot}5 \times 10^9$ organisms 3 had a titre of 1:80 a year later, and of 30 calves vaccinated with a dose containing 25×10^9 organisms none was positive a year later. In 12 rabbits there was a distinct correlation between the initial height of the agglutination titre and the number of Strain 19 brucella injected. A dose of 25×10^9 Strain 19 brucella is recommended for vaccination of calves.—M.G.G.

CHERNUISHEVA, M. I. (1957). **[Cytological method for investigating the mechanism of immunity in brucellosis.]**—*Proc. Lenin. Acad. agric. Sci.* **22,** No. 9. pp. 11-15. [In Russian.] **2417**

An account of observations on the character and intensity of the cellular reaction of the reticuloendothelial system and its immunological significance in relation to *Br. abortus* infection, from a study of cytograms taken from various parts of the body of g.pigs (a) superinfected and (b) revaccinated with this organism. (a) A number of animals in this group were first vaccinated with *Br. abortus* Strain 19 and then challenged s/c with a heavy dose of suspension of fully virulent organisms of *Br. abortus* Strain M at 1–5–15 days after vaccination. Impression-smears (prepared according to a method of M.P. Pokrovskaya—not described) from a site of inoculation, regional lymph node, liver and spleen taken 24 hours after vaccination showed purely leucocytic infiltration around the site of inoculation, which was ineffective against the introduced agent. At the approach of the 15th day, and therefore with the establishment of immunity, this was gradually replaced by other elements of the r.e.s., mainly polyblasts and macrophages, actively phagocytic and with full lytic ability for *Br. abortus* organisms. (b) The cellular reaction in revaccinated g.pigs was similar to that observed in animals challenged on or around the 15th day after vaccination. Initial response was somewhat delayed in animals revaccinated after 8 months as compared with those done after 3 months. This was interpreted as a sign of weakening of the immunity and therefore a right moment for revaccination. —S. TERLECKI.

PARNAS, J. (1957). De la possibilité de transformer les variétés de la brucelle. **[The possibility of transforming varieties of brucella.]** — *Ann. Inst. Pasteur* **92,** 257-261. [Summary in English.] **2418**

Substrates were prepared from a given strain of brucella by exposing washed bacterial suspensions to ultrasonic waves, followed by heating at 60°C. for 30 min. It was assumed that these substrates contained metabolites and antigens of the bacteria. Presumably (although it does not appear to have been proved) no living bacteria were present. 1 ml. of substrate was placed in a test tube and a suspension of a different strain

was added. After up to 25 passages in these "heterologous metabolites" the strain changed: thus *Br. abortus* or *melitensis* grown in *Br. suis* substrate was stated to assume the properties of an atypical strain of *Br. suis*, while *Br. suis* on *melitensis* substrate also become an atypical strain of *suis*. P. named the process "metabolic hybridization".—R.M.

ROSENBERGER, G. & GRUNERT, E. (1958). Über einen erfolgreichen Behandlungsversuch mit einem neuen Wirkstoff an brucelloseinfizierten Rindern und Möglichkeiten der Chemotherapie im Rahmen der Abortus-Bang-Bekämpfung. **[Treatment of bovine brucellosis with a new drug, "Pecudin", and the possibility of chemotherapy in the control of brucellosis.]** — *Dtsch. tierärztl. Wschr.* **65**, 257-263. [Summary in English.] **2419**

"Pecudin" or "SR 692" (N^1-dichloracetyl-N^1-phenylsemicarbazide) was given by mouth as a drench or mixed with the food. Ten spontaneously infected and 2 experimentally infected cows were given from 5 to 40 g. daily for several weeks. Treatment did not stop secretion of brucella in milk and may have delayed but did not prevent abortion. Prophylaxis was tested on 2 healthy pregnant cows aged 2 years: daily administration of 5 g. of the drug commenced 8 days before experimental conjunctival infection and lasted for at least 6 months. Both had a normal gestation period and normal parturition; serological tests on milk and blood remained negative. The authors suggested that prophylactic use of the drug may be of value in herds adjoining infected herds, in fresh infection of an uninfected herd, and to hinder the spread of infection in a badly infected herd.—R.M.

HEILMAN, D. H., HOWARD, D. H. & CARPENTER, C. M. (1958). **Tissue culture studies on bacterial allergy in experimental brucellosis. I. The effect of *Brucella suis* whole antigen on cultures of spleen from normal and brucella-infected guinea pigs.**—*J. exp. Med.* **107**, 319-332. [Authors' summary modified.] **2420**

A study was made of the effect of whole cell *Brucella* antigen on tissue cultures of spleen from normal and *Brucella*-infected g.pigs. The degree of toxicity was based upon the inhibition of migration of wandering cells and upon the morphological appearance of stained sections of tissue cultures at different periods of incubation. A suspension of heat-killed *Br. suis* was more toxic for spleen cells from g.pigs infected with *Br. suis* than for normal spleen cells. Macrophages were more sensitive than leucocytes to the toxic action of the antigen. The degenerative changes observed in *Brucella*-sensitive cells exposed to the antigen were similar to the degeneration previously observed in cultures of tuberculin-sensitive cells in the presence of tuberculin. The specific toxicity of the whole *Brucella* antigen, however, was more marked than that of tuberculin. Preliminary experiments indicated that serum and plasma containing specific antibodies obtained from *Brucella*-infected g.pigs reduced the toxic effect of the antigen in cultures of both normal and *Brucella*-sensitive cells. The protective action of the homologous immune serum for *Brucella*-sensitive cells was greater than for normal cells.

ANON. (1957). **Vaccine for goat brucellosis.**—*Science* **126**, 20. **2421**

This note refers to a *Brucella melitensis* vaccine developed by Elberg [see *V.B.* **27**, 2325], and states that Elberg's results have been confirmed by workers at Weybridge.—M.G.G.

ANCZYKOWSKI, F., MURAT, P. & GRYCZOWA, B. (1958). Bruceloza u drobiu. IIIa. W sprawie współaglutynacji pałeczki *Brucella* i *S. pullorum*). **[Avian brucellosis. IIIa. Cross-agglutination between *Brucella* and *Salmonella pullorum*.]**—*Méd. vét., Varsovie* **14**, 10-11. [In Polish.] **2422**

The authors examined blood from 2486 birds of all ages, from farms where infection with brucella or *Salmonella pullorum*, or both, was established, and failed to record any cross-agglutination reactions.—M. GITTER.

REYNOLDS, I. M. & SMITH, R. E. (1958). **Serological survey for *Leptospira pomona* antibodies in cattle and deer in Massachusetts.**—*J. Amer. vet. med. Ass.* **132**, 293-296. [Authors' summary modified.] **2423**

Of 10,780 cattle in 491 herds, 90 cattle (0·83%) in 13 herds (2·6%) were serologically positive for *L. pomona* infection. Of 628 deer sera all were negative. The total estimated deer population in Massachusetts is 20,000.

MCDONALD, N. R. & RUDGE, J. M. (1957). **Prevention of leptospirosis in young calves by vaccinating their dams in late pregnancy.**—*N. Z. vet. J.* **5**, 83-92. **2424**

In two experiments cows were vaccinated twice in late pregnancy with either a formolized alum precipitated or a freeze-dried vaccine and their calves challenged with the homologous strain at 10 or 25 days of age. All of the 20 controls but only one of the 26 calves born to vaccinated dams became infected although 14 showed temperature responses exceeding 104°F. No correlation was detected between agglutination lysis titres and immunity. The alum precipitated vaccine gave higher and more per-

sistent antibody serum responses, but no difference was noted in the immunogenic properties of the two vaccines.—A. ACKROYD.

ALIEV, A. G. (1957). **[Treatment of leptospirosis with vitamin B_{12} and biomycin.]** — *Proc. Lenin Acad. agric. Sci.* **22,** No. 12. pp. 31-35. [In Russian.] **2425**

From trials with 12 puppies and 3 lambs, the author recommended the following treatment for leptospirosis in animals: 15–30 g. vitamin B_{12}, and 10 mg./kg. body wt. biomycin [chlortetracycline], both drugs injected i/m daily for 3 days.—R.M.

LOCOCO, S., BOHL, E. H. & SMITH, H. R. (1958). **Treatment of porcine leptospiruria.** — *J. Amer. vet. med. Ass.* **132,** 251-253. [Authors' summary modified.] **2426**

Leptospiruria was consistently established in pigs by inoculation with *Leptospira pomona*. One i/m inj. of dihydrostreptomycin (10 to 20 mg. per lb. body wt.) eradicated leptospiruria in all of 41 animals.

WEBSTER, W. M. (1957). **The hedgehog as a potential reservoir of** *Leptospira pomona*. — *N. Z. vet. J.* **5,** 113. **2427**

All of 30 hedgehogs inoculated with cultures of *L. pomona* developed leptospirosis and the adult animals, which usually recovered, became carriers. Two hedgehogs caught on a farm where an outbreak of leptospiral abortion had recently occurred, had characteristic post-mortem lesions. The extent of natural infection in the field is being investigated.—A. ACKROYD.

WARFOLOMEJEVA, A. A. [VARFOLOMEEVA, A. A.] (1958). Charakteristik und Nomenklatur des Erregers der Leptospirosen *L. monjakow.* **[Characteristics and nomenclature of** *Leptospira monjakov.***]**—*Zbl. Bakt. I. Orig.* **171,** 71-75. [Summaries in English, French, Spanish and Russian.] **2428**

A leptospire was isolated in the U.S.S.R. in 1940 from non-icteric infection in a human being by Terskikh and was later isolated from horse, cattle, pig, silver fox, rat and *Apodemus agrarius*. It has been named *L. monjakov,* or Type II [cf. *V.B.* **27,** 2329] or "Strain DVB" [=Far-Eastern Strain B]. The present author found that this leptospire was identical with *L. pomona* in agglutination test and in cross-immunity tests with rabbits.—R.M.

POKORNÝ, J. & HAVLÍK, O. (1957). Čištění kontaminových kultur leptospir membránovými filtry. **[Purification of contaminated cultures of leptospira with membrane filters.]** —*Csl. Epidemiol., Mikrobiol. Imunol.* **6,** 204-208. [In Czech. Summaries in English and Russian.] **2429**

The authors described purification of 30 contaminated leptospira cultures, using membrane filters. Moulds, yeasts and air-borne spore bearers did not pass through filter No. 3 of an approximate pore size of 0·5 μ. For the exclusion of staphylococci filter No. 4 was recommended. Leptospira were retained by filters No. 9 and No. 10, pore size 0·025 μ and 0·01 μ, respectively. To ensure sterility of media, incubation for a few days at 23°C. was recommended.—E.G.

RUDGE, J. M. (1958). **Observations on the efficiency of animal inoculation for isolating leptospirae from kidney tissue.**—*N. Z. vet. J.* **6,** 15-16. [Author's summary modified.] **2430**

The efficiency of animal inoculation in demonstrating viable leptospires in kidney tissue may be seriously reduced if the specimen is from an animal with a high agglutination-lysis titre. The organisms may be inactivated by specific antibody during the preparation of the inoculum.

HELWIG, D. M. (1958). **Entero-toxaemia in calves.** In "The Stock Inspector" **1957.** pp. 49-50. [Sydney: Institute of Inspectors of Stock of N.S.W.] **2431**

Three types of enterotoxaemia occur in calves: peracute with diarrhoea and sudden death; acute with dullness and inappetence, sometimes scouring and temperature followed by prostration, or mania and ultimately death; and subacute with progressive depression and scouring leading frequently to death in 2–3 days. The condition occurs in calves 1–10 days old, and in calves 2–3 months old, well fed and in good condition. As absorption of *Clostridium welchii* toxin from the bowel is the chief cause, treatment with the appropriate type antiserum or vaccine can check mortality.—A. ACKROYD.

MÁLEK, P., KOLC, J. & ŽÁK, F. (1957). Zur Pathogenese und der experimentellen Therapie des Tetanus: Über die Möglichkeit der "spezifischen Blockade" des lymphathischen Systems. **[Pathogenesis and experimental therapy of tetanus. Possibility of specific blockade of the lymphatic system.]**—*Zbl. Bakt. I. (Orig.)* **169,** 233-249. [Summaries in English, French and Russian.] **2432**

Tetanus toxin injected into the left hypogastrium of g.pigs was "blocked" by the injection of antitoxin into the left thigh immediately or 30 min. after the toxin. Both sites had common lymphatic drainage by way of the lateral inguinal and para-aortal lymph nodes.

All g.pigs thus treated survived, while a high proportion of those in which the antitoxin was injected in other sites died.—R.M.

PREVOT, A. R., RAYNAUD, M., TURPIN, A. & SILLIOC, R. (1958). Vaccination antibotulique du vison par injection unique d'anatoxine concentrée adsorbée. [**Immunization of mink against botulism with a single injection of concentrated adsorbed toxoid.**]—*C.R. Acad. Sci., Paris* **246,** 1632-1633. **2433**

Cl. botulinum Cβ toxin containing 300,000 m.l.d. for mice/ml. was concentrated through collodion membranes and after inactivation was adsorbed on calcium phosphate gel. 10 mink each inoculated s/c with 1 ml. resisted infection with 5,000-40,000 lethal doses for mink of toxin ten days later.—R.M.

LINDSEY, D., WISE, H. M. & KNECHT, A. T. (1958). **Relation of growth of clostridia to mortality following an experimental wound in the goat.**—*Fed. Proc.* **17,** 98. **2434**

Death following infection of experimentally produced wounds appeared to be due to the multiplication of clostridia rather than staphylococci, faecal streptococci or coliform organisms, and it depended on the concentration of clostridia in wound exudate.—R.M.

PLASTRIDGE, W. N., WALKER, E. C., WILLIAMS, L. F., STULA, E. F. & KIGGINS, E. M. (1957). **Isolation of *Vibrio fetus* from bulls.**—*Amer. J. vet. Res.* **18,** 575-578. **2435**

A procedure for isolating *V. fetus* from bull semen and preputial washings is described, with blood agar as the culture medium. When 544 samples of semen from 149 bulls were tested, 61 (41%) of the bulls proved to be infected, 39% being detected at the first test, 28% at the second, 28% at the third, and 5% at the fourth or fifth. Three tests are therefore necessary in practice before a bull can be declared free from *V. fetus* infection. In repeated tests on 57 infected bulls *V. fetus* was isolated from 143 (54%) of 263 semen samples. Of 18 preputial washings from 12 infected bulls 7 yielded *V. fetus*.—M.G.G.

ADLER, H. C. (1957). **Genital vibriosis in the bovine. Experimental investigation with a special view to diagnosis, prophylaxis, and therapy.**—*Thesis, Copenhagen* pp. 130. [In English. Summary in Danish.] **2436**

Cervical fluid for diagnostic purposes was collected by the method described by Rasbech [*V.B.* **22,** 3892]. Culture of material thus obtained from 290 heifers more often yielded pure cultures of *V. fetus* than vaginal mucus. Greater reliability was achieved by taking two samples from each animal, one from the external os and one from the internal os. 583 bulls were examined for vibriosis by inoculating semen or preputial washings into the cervical canal of maiden heifers: infection was found to be fairly common in bulls in A.I. centres in Denmark. Treatment of diluted semen from an infected bull with 600 μg./ml. streptomycin protected 45 heifers from infection. Protection was also achieved by infusing into the uterus and cervix a mixture of 1 g. dihydrostreptomycin and 400,000 i.u. penicillin in 20 ml. oil, within 24 hours of insemination with infected semen. Treatment of cows already infected with the same dose of streptomycin in 20 ml. oil or water was effective if repeated daily for 3 days or twice at an interval of 48 hours. Local or systemic treatment of infected bulls with streptomycin gave temporary cures in most cases and cures lasting more than a year in some.—R.M.

KIGGINS, E. M. & PLASTRIDGE, W. N. (1958). **Some metabolic activities of *Vibrio fetus* of bovine origin.** — *J. Bact.* **75,** 205-208. [Authors' summary modified.] **2437**

Use of a Warburg apparatus showed that the common carbohydrates were not oxidized by *V. fetus* and that, with the exception of sodium pyruvate oxidation, the Embden-Meyerhof glycolytic schema was not operative. However, all the compounds of the tricarboxylic acid cycle were oxidized. Of 23 amino-acids, there was oxygen uptake only with glutamic acid, aspartic acid, glutamine, asparagine, proline and cysteine. Acetate was the only fatty acid tested which was oxidized.

GOŁĘBIOWSKI, S. (1958). Wibrioza (dyzenteria) świń w województwie łódzkim. [**Vibrionic dysentery in pigs in the Lodz district.**] — *Méd. vét., Varsovie* **14,** 65-72. [In Polish. Summaries in English and Russian.] **2438**

The disease was investigated on 2 large pig breeding farms. 3 weeks to 5 months appeared to be the most susceptible ages and the disease ran a peracute, acute and chronic course with the mortality rate up to 70%. Haemorrhagic gastritis and necrotic colitis were usually seen on P.M. examination. *V. suis* (*V. coli*) was recovered frequently from the submucosa of the colon and often in pure culture from the mesenteric lymph nodes. For primary isolation, incubation in CO_2 atmosphere was necessary but after a few months of subcultivation the organism could be grown under aerobic conditions. A 10% sheep blood agar proved a very good medium for both primary isolation and subcultivation. Mice and g.pigs were not sus-

ceptible to *V. suis* and attempts at agglutination and complement-fixation tests, as diagnostic methods, failed. The control of the disease was based on isolation and treatment of all affected pigs, cleaning and disinfection of sties and feeding-troughs twice daily and prevention of stress factors. In treatment of sick animals best results were obtained by oral administration of streptomycin at the rate of 0·5 g. once daily for 3 days or chloramphenicol 50 mg. per kg. body wt. twice daily for 3 days. Sulphaguanidine in food (0·2 g. per kg. body wt. 3 times daily for 4 days) and combined oral sulphaguanidine and parenteral streptomycin also proved efficacious. —M. GITTER.

TRUSZCZYŃSKI, M. (1957). Dalsze badania nad etiologia dyzenterii świń. **[Further investigations on the aetiology of swine dysentery.]** —*Roczn. Nauk rol.* **68,** Ser. E. 141-161. [In Polish. Summaries in English and Russian.] **2439**

The disease was diagnosed on 4 farms and *V. suis* (*V. coli*) recovered from the intestinal tract of the affected pigs. On one farm where 79 out of 357 pigs died within 23 days there was history of recent vaccinations against swine fever and swine erysipelas. Bacteriological examinations and transmission experiments eliminated swine fever and swine erysipelas as cause of death. Mice, g.pigs and rabbits were not susceptible to *V. coli* but 4 out of 8 pigeons died after i/m and i/v inoculation with a culture of the organism, and *V. coli* was recovered from their blood and internal organs. 6 pigs were fed for 3 consecutive days 48-hour blood agar cultures of the organism; 1 developed typical dysentery after 8 days, 3 transient diarrhoea, and 2 remained healthy. Four other pigs were fed cultures 2 days after crystal violet vaccination; 2 developed typical dysentery after 16-18 days and one of them died; one of 2 in-contact pigs also developed dysentery. T. found *V. suis* in 12 out of 20 slaughter pigs and in 26 out of 30 used for the production of crystal violet vaccine. He regards *V. suis* as a facultative pathogen and is of the opinion that the manifestation of clinical symptoms is produced by stress factors lowering the animal's resistance. —M. GITTER.

STEWART, D. F. (1958). **The differential diagnosis and treatment of footrot and the cultural requirements of *F. nodosus*.** In "The Stock Inspector" 1957 pp. 31, 33, & 35. [Sydney: Institute of Inspectors of Stock of N.S.W.] **2440**

A condition termed "scald", which in its early stages is almost indistinguishable from foot rot except for the absence of the distinctive odour, has recently become prevalent in Australia. Examination of smears is not always conclusive as organisms resembling *Fusiformis nodosus* may be seen but the condition responds rapidly to foot-bathing in 5% formalin. *F. nodosus* will not always grow in the usual horse serum–cystein medium, but a substance prepared by the proteolytic digestion of a urea extract of prekeratin from sheep's feet has been found regularly to support its growth. In the treatment of foot rot, 5% terramycin in methylated spirits, although unstable, has given even better results than 10% Chloromycetin in methylated spirits. Even after treatment with these antibiotics, affected sheep should be held for some time before regarding them as cured. —A. ACKROYD.

STANECKI, J., FAST, J. & KRZYWY, T. (1958). **Inactivation of the bacteriostatic action of chlortetracycline by substances produced by bacterial metabolism.** — *Antibiot. & Chemother.* **8,** 167-170. [Summary in Spanish p. 215.] **2441**

One ml. of filtrate from liquid cultures (120–144 hours old) of some *Pseudomonas* and *Proteus* strains inactivated on the average 10 μg. of chlortetracycline as judged by the loss of bacteriostatic action on *Staphylococcus aureus* (Oxford strain). This property was not observed in strains of *Escherichia coli*. Filtrates from 48-hour cultures did not inactivate chlortetracycline.—M.G.G.

O'GRADY, F. & THOMPSON, R. E. M. (1958). **Comparative effects of chlortetracycline and cortisone on a local monilial lesion in the mouse.** — *Brit. J. Pharmacol.* **13,** 1-5. [Authors' summary modified.] **2442**

The course of a local, closed *Candida albicans* lesion in the thigh of the mouse is described. Treatment with chlortetracycline s/c in almost toxic doses led to permanent suppression of the lesion indistinguishable from a cure. Treatment with cortisone s/c suppressed the lesion temporarily, with subsequent relapse. Super-injection of the lesions with chlortetracycline produced a very large and persistent swelling. Treatment of these lesions with chlortetracycline s/c in almost toxic doses led to suppression and relapse resembling that seen in lesions super-injected and treated with cortisone. Aspirin, chosen for its insolubility and acidity, and turpentine, chosen for its irritant effect, did not reproduce the effects of chlortetracycline or cortisone. While it is possible that the suppressive effect of chlortetracycline and cortisone is

in certain circumstances related, the local irritant effect of chlortetracycline plays an important part in the enhancement of these lesions.

AJELLO, L. (1958). **Occurrence of *Cryptococcus neoformans* in soils.**—*Amer. J. Hyg.* **67,** 72-77. **2443**

Cryptococcus neoformans was isolated from 14 of 1,127 soil samples. Ten of the 14 isolates came from areas frequented by chickens and pigeons, such as chicken houses, chicken runs and a pigeon nest.

The significance of the correlation of *C. neoformans* with birds is discussed along with the apparent discrepancy between the high prevalence of *C. neoformans* in soil and infrequency of human and animal infections.—R.M.

GEORG, L. K., KAPLAN, W. & CAMP, L. B. (1957). **Equine ringworm with special reference to *Trichophyton equinum*.** — *Amer. J. vet. Res.* **18,** 798-810. **2444**

Twenty-five strains of dermatophytes isolated from horses in the U.S.A., Great Britain and Canada were studied morphologically and culturally. Ability to perforate hair *in vitro* was also examined. *Trichophyton equinum* is considered to be a valid species, distinct from *T. mentagrophytes*, and is the commonest cause of equine ringworm in all three countries. It seems that its nutritional need for nicotinic acid favours its growth on horse hair since this appears to provide nicotinic acid or its precursors. The colonial form and pigmentation are characteristic and the mode of invasion of the hair is ectothrix, with medium to large spores (3·5–8·0 μ). The clinical disease does not differ in the horse from that produced in this animal by other dermatophytes, which in order of frequency are *Microsporum canis, T. mentagrophytes* var. *granular, T. verrucosum* and *M. gypseum*.—E. G. WHITE.

AUSTWICK, P. K. C. (1958). **Cutaneous streptothricosis, mycotic dermatitis and strawberry foot rot and the genus *Dermatophilus* Van Saceghem.** — *Vet. Rev. Annot.* **4,** 33-48. [Author's summary.] **2445**

The histories of bovine cutaneous streptothricosis and of mycotic dermatitis and strawberry foot rot in sheep are reviewed, and the relationships of the causal organisms discussed. The organisms are considered to be congeneric and *Dermatophilus* the earliest generic name for them. Three species are recognized—*D. congolensis* from streptothricosis in cattle, *D. dermatonomus* from mycotic dermatitis in sheep and *D. pedis comb. nov.* from strawberry foot rot of sheep. The genus is placed in a new family—the Dermatophilaceae of the Actinomycetales.

DUNLOP, A. A. & HAYMAN, R. H. (1958). **Differences among Merino strains in resistance to fleece-rot.**—*Aust. J. agric. Res.* **9,** 260-266. [Authors' summary modified.] **2446**

The incidence of fleece rot was studied in a number of strains of Merino sheep distributed variously over five sets of field conditions. In three locations rainfall was sufficiently high to cause moderate to high incidence of fleece rot among susceptible sheep. In two other locations conditions were such that its occurrence in susceptible sheep was either negligible or absent. In two of the former localities South Australian strong-wool Merinos proved to be highly susceptible, while in two medium-wool Peppin strains the susceptibility varied from moderate to high. In a medium-wool non-Peppin strain the incidence was less than in the Peppin and South Australian strains; in a fine non-Peppin strain the incidence was moderate to low; while in a flock of Camden Park fine-wools the incidence was low.

GREGORY, T. S. (1957). **Contagious bovine pleuropneumonia. Report of investigations in Australia.**—*Bull. epiz. Dis. Afr.* **5,** 187-198. [In French pp. 265-278.] **2447**

Present knowledge on the nutritional requirements and metabolism of the causal organism of bovine contagious pleuropneumonia is summarized. The official diagnostic test in Australia is the c.f. test, which is highly specific, although it has been shown that a strain of *Actinobacillus lignieresi* has an antigen in common with the V_5 strain of the pleuropneumonia organism. The test is sensitive, but false negative reactions occasionally occur, and it is possible that chronically infected animals may lose their reactivity. The whole-blood slide agglutination test, although less reliable, is quick and simple to perform and is therefore useful in the field. Vaccination is in the tail with a living culture of Strain V_5. The question of natural resistance is discussed, and the methods of eradicating the disease are described. The following conclusions are drawn: there is no evidence of more than one immunological type in Australia; resistance develops within a few days after vaccination and lasts for at least 3 years; there seems to be no advantage in annual vaccination; about 3% of animals do not respond to vaccination.—M.G.G.

PRIESTLEY, F. W. (1957). **Further observations on the bactericidal action of cattle blood on**

the contagious bovine pleuropneumonia organism.—*Brit. vet. J.* **113,** 464-469. **2448**

P. corrects an erroneous conclusion which he had arrived at previously [*V.B.* **22,** 3308], namely that the "lack of bactericidal action in the blood of animals dying of pleuropneumonia was due to a deficiency of complement". The error arose from failure to appreciate the differing susceptibilities of the organism from culture and from infected tissues or body fluids.

He also brings forward evidence that in addition to the A and B antigens described by Dafaalla [*V.B.* **28,** 61], the pleuropneumonia organism also possesses a third antigen (C) produced only by fully virulent organisms in the animal body.

PROVOST, A. (1958). Parenté antigénique entre le virus vaccinal et *Mycoplasma mycoïdes*, agent de la péripneumonie bovine. **[Antigen relationship between vaccinia virus and the agent of bovine contagious pleuropneumonia.]** — *C. R. Acad. Sci., Paris* **246,** 1323-1326. **2449**

In complement-fixation tests serum from cattle with contagious pleuropneumonia gave positive results with vaccinia virus antigen and *vice versa*. Slide agglutination was always negative in cross tests. It was stated that the results confirmed those reported by Heslop [*J. comp. Path.* **35,** 1, (1922).]—R.M.

MANJREKAR, S. L., DHAKE, P. R. & KULKARNI, V. B. (1958). **The laboratory diagnosis of contagious caprine pleuro-pneumonia.** — *Indian vet. J.* **35,** 22-29. **2450**

The authors found that normal ox serum agglutinated up to fairly high titres cultures of the causative organism as well as suspensions of the affected lung exudate, and they recommended the application of this observation as a diagnostic test. They also tested material from a few lungs not affected with the disease, but found only low titres.—R. N. MOHAN.

ORFILA, J. (1958). Sensibilité *in vitro* de 26 souches de pleuropneumonia-like-organisms à l'action d'agents chimiothérapiques. **[Sensitivity of 26 strains of pleuropneumonia-like organisms to chemotherapeutic agents *in vitro*.]** — *Ann. Inst. Pasteur* **94,** 516-520. [Summary in English.] **2451**

Two bovine strains of P.P.L.O. were strongly inhibited by oxytetracycline (2,500 units/ml.), chloramphenicol (1,000 units/ml.) and furadantine. Chlortetracycline, erythromycin and streptomycin were only weakly inhibitory and penicillin and "Irgamide" were inactive.—R.M.

TOSHKOV, A. (1957). **[Veterinary microbiology. A text-book for students at veterinary colleges.]** pp. 338. Sofia: Durzhavno izd. za selsk. lit 12. 30 leva. [In Bulgarian.] **2452**

This Bulgarian text-book provides basic information about general microbiology and bacteria, fungi and viruses of veterinary interest.—R.M.

HELWIG, R. (1957). Untersuchungen an cellulosezersetzenden Pansenbakterien. **[Studies of cellulose-digesting rumen bacteria.]**—*Arch. Mikrobiol.* **25,** 352-368. **2453**

Ten strains of rumen bacteria from cattle and seven from sheep belonged to three main types. Types one and two were both cellulose-digesting but either non-motile and non-sporulating or motile and sporulating. The third type included non-cellulose-digesting streptococci. Fermentation of six carbohydrates with the aid of these strains was tested. The cellulose break-down products included acetic acid, propionic acid, i-butyric acid, i-valerianic acid, n-valerianic acid, and lactic acid. In some strains of ovine origin there were also traces of capronic acid. The relationship acetic-butyric acid, and butyric-propionic acid was constant. Cellulose break-down was enhanced by i-butyric, n-capronic, n-valerianic and lactic acid, but not by acetic and propionic acid.—E.G.

HUNT, W. G. & MOORE, R. O. (1958). **The proteolytic system of a Gram negative rod isolated from the bovine rumen.** — *Appl. Microbiol.* **6,** 36-39. **2454**

An unidentified organism isolated from rumen contents of a steer produced an extremely active proteinase which attacked native and denatured proteins. Maximum activity occurred at pH 7·5; cobalt ions enhanced activity while reducing agents and sulphhydryl group reagents inhibited it.—R.M.

See also absts. **2703** (report, Kenya); **2704** (report, Trinidad & Tobago); **2705** (report, Netherlands); **2707** (book, mycoses of man and animals).

DISEASES CAUSED BY PROTOZOAN PARASITES

CUCKLER, A. C. *et al.* (1958). **Chemotherapeutic and pharmacological studies on glaucarubin, a specific amebacide.** — *Arch. int. Pharmacodyn.* **114,** 307-321. [In English.] **2455**

Glaucarubin prepared from the fruit of

Simarouba glauca was active against *Entamoeba histolytica* infection but was inactive against infection with *Trypanosoma brucei, Trichomonas foetus, Histomonas meleagridis* and *Eimeria tenella*.—R.M.

CANTRELL, W. (1958). **Antibody-resistance in *Trypanosoma equiperdum*.**—*Fed. Proc.* **17,** 356. [Author's abst. modified.] **2456**

The ability of trypanosomes to become resistant to antibody is similar in some respects to the ability to acquire drug resistance which is possessed by most micro-organisms. The origin of resistance in both types of organism may be either spontaneous or induced by antibody or drug. Certain features of the antibody resistance phenomenon make it more accessible to analysis. These are the comparatively high rate of occurrence of the change and the fact that antibody resistance is usually absolute while drug resistance is partial. In the case of *T. equiperdum* in the rat the mutation rate of the change to antibody resistance was found to be about one mutant cell per million new cells. This mutation was not induced by antibody for the change was independent of the antibody concentration in the rat.

CLARKSON, M. J. & GENTILES, M. A. (1958). **Coccidiosis in turkeys.**—*Vet. Rec.* **70,** 211-214. **2457**

Eimeria adenoeides and *E. meleagrimitis* are of importance in turkeys in Great Britain. This paper discusses the important features of the two species in experimentally infected turkeys and describes some outbreaks of disease in the field. *E. adenoeides* and *E. meleagrimitis* can be distinguished by the site and nature of the lesions they cause, together with the dimensions and character of the oocysts. Oocysts of both species sporulate in about 24 hours at 26°C. The prepatent period of *E. adenoeides* is five days; that of *E. meleagrimitis* "just under five days". Symptoms and pathogenicity of the two species are described. The pathogenic effect is connected with the development of the sexual stages; not the schizonts. Sulphaquinoxaline is effective in controlling *E. adenoeides*. The effect on *E. meleagrimitis* is not known. An age resistance, unconnected with previous infection, is stated to occur. Observation of 22 field outbreaks suggested that 15 could be attributed to *E. adenoeides*, four to *E. meleagrimitis* and three were of mixed origin.—S. BRIAN KENDALL.

HANSARD, S. L. & FOOTE, L. E. (1958). **Effects of anaplasmosis on physiological behavior of chromium 51 and iron 59 in young calves.**—*Fed. Proc.* **17,** 478. [Authors' abst. modified.] **2458**

The anaemia of anaplasmosis was investigated using conventional and radioisotope procedures in 30 trials with 19 young calves. Homologous erythrocytes labelled with Cr^{51} were employed for peripheral blood studies and Fe^{59} citrate to study the effects of the disease upon red cell formation. Total blood, red cell and plasma volumes, total haemoglobin, red cell life span, plasma iron clearance and percentage erythrocytes containing marginal bodies were determined concurrently at periodic intervals before, during and following onset of the disease. The results indicated: (1) a slight increase in total blood volume and a significant increase in the ratio of total plasma to r.b.c. in all infected animals; (2) a progressive decrease in r.b.c. volume, haemoglobin and haematocrit from 5 days before until 2–3 days following the period of peak anaplasma marginal body count; (3) a suppression of the haemopoietic system and/or the presence of short lived red cells appear to be significant factors in the pathogenesis of the anaemia; (4) that during the recovery phase haemoglobin increased more rapidly than red cell volume, and effects of the disease appeared to have a greater influence upon haemoglobin formation.

HARTLEY, W. J. & MARSHALL, S. C. (1957). **Toxoplasmosis as a cause of ovine perinatal mortality.**—*N. Z. vet. J.* **5,** 119-124. **2459**

Toxoplasms were isolated from small necrotic foci in the foetal cotyledons of sheep affected with "New Zealand Type II Abortion" as described by Hartley & Boyes (1955) [*Proc. N.Z. Soc. Anim. Prod.* **15,** 120] and were successfully transmitted to mice and sheep. Of four sheep given a third (mouse) passage strain of the parasites, one aborted while the others had full-term live lambs. All four, however, delivered diseased foetal membranes from which toxoplasms were isolated.

Preliminary serological investigations were made.—S. BRIAN KENDALL.

HOLZ, J. (1957). Die Prädilektionsorte von Sarcosporidien in Büffeln. **[Predilection sites of sarcosporidia in buffaloes.]**—*Hemera Zoa* **64,** 136-142. [In German. Summaries in English and Indonesian.] **2460**

In Java, 40 slaughter buffaloes, in which sarcosporidiosis had been diagnosed by macroscopical observation of cysts in the oesophagus, were selected for histological examination of stained tissue sections from the pharynx, heart,

croup musculature, and spleen. Those from the eastern part of the island had cysts in the pharynx also, but those from the western part, besides having cysts in the pharynx, also had Miescher's tubes in the musculature and heart. —M.G.G.

CLARK, G. M. (1958). ***Hepatozoon griseisciuri* n. sp.; a new species of *Hepatozoon* from the grey squirrel (*Sciurus carolinensis* Gmelin, 1788), with studies on the life cycle.** — *J. Parasit.* **44,** 52-63. [Author's summary.] **2461**

Hepatozoon griseisciuri n. sp. is described from *S. carolinensis,* the eastern grey squirrel. Sporogony in the mites *Echinolaelaps echidninus* in the laboratory and *Euhaemogamasus ambulans* from squirrel nests in the field is reported. Schizogony in the spleen, liver, and bone marrow of a squirrel 36 hours old is described.

See also abst. **2708** (symposium on trichomonad vaginitis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

LUCAM, F., FLACHAT, C., FEDIDA, M., FONTAINE, J. & DANNACHER, G. (1958). Caractères de l'immunité anti-aphteuse locale révélés par le titrage du virus aphteux sur boeuf vacciné. **[Features of local immunity in foot and mouth disease revealed by titration of the virus in vaccinated cattle.]**—*C. R. Acad. Sci., Paris* **246,** 2306-2308. **2462**

Cattle were inoculated s/c with 15 ml. of a monovalent F. & M. disease vaccine. After 3 weeks virus titration was performed using these and non-vaccinated cattle. Vaccinated cattle differed from unvaccinated cattle in three respects: the titration was slower (optimum readings between the 36th and 46th hours compared with 24–30 hours in the controls); the primary tongue lesions were more discrete and differed histologically; and the virus titres obtained were lower.—R.M.

LÜBKE, A. (1957). Herzveränderungen erwachsener, mit Urethan vergifteter Mäuse nach Infektion mit dem Maul- und-Klauenseuche-Virus. **[Heart lesions in adult mice poisoned with urethane after infection with foot and mouth disease virus.]**—*Mh. Tierheilk.* **9,** 187-201. **2463**

Adult mice do not normally develop lesions in the heart muscle after i/p infection with F. & M. disease virus. Heart lesions developed when, for several days before infection, urethane was injected i/p at toxic dosage (1 mg./kg. body wt. daily).—R.M.

BROWN, F. & CRICK, J. (1958). **Application of agar gel precipitin tests to the study of the virus of foot-and-mouth disease.**—*Virology* **5,** 133-144. [Authors' summary modified.] **2464**

Suspensions of F. & M. disease virus prepared from infected animals or from tissue cultures give two precipitin lines with homotypic immune serum in the agar gel diffusion test. The two lines are identical with the individual lines produced when the 20 mμ and 7 mμ components, obtained by differential centrifugation of the virus, are allowed to diffuse against the homotypic immune serum. Although each component gives a precipitin line with homotypic immune serum only, formation of the line due to the 7 mμ component can be prevented by mixing it with either homotypic or heterotypic immune serum. On the other hand, formation of the line by the 20 mμ component can be prevented by homotypic immune serum only. The precipitin line patterns obtained with virus suspensions which have been heated or treated with formalin are also described.

REAGAN, R. L., YANCEY, F. S. & BRUECKNER, A. L. (1957). **Response of suckling hamsters to pseudorabies virus (Aujeszky strain) by peripheral routes.**—*Trans. Amer. micr. Soc.* **76,** 78-80. **2465**

Unweaned hamsters, divided into nine groups, were infected with 0·06 ml. of a 20% Aujeszky virus suspension i/d, i/p, by rectum and by mouth, with 0·02 ml. intracerebrally and intranasally, and with 0·01 ml. intracardially, intraocularly and intralingually. All those infected died within 3-6 days. The virus was recovered by mouse inoculation from pooled, ground brain tissue suspended in saline. The dams remained healthy for a period of observation of 14 days. It was concluded that unweaned hamsters are well suited for use in the diagnosis of Aujeszky's disease because they are very susceptible and more easily handled than adults. —E.G.

KERSTING, G., KERÉKJÁRTÓ, B. V. & ROHDE, B. (1958). Über charakteristische Zellveränderungen in der Kultur epithelialen Gewebes nach der Infektion mit Aujeszky- und B-Virus. **[Characteristic cell changes in cultures of epithelial tissue after infection with Aujeszky's disease virus and virus B.]**—*Z. Naturf.* **12b,** 160-164. **2466**

Both viruses caused the same primary

changes in cultures of monkey kidney epithelium, but the secondary changes differed. The formation of acidophile inclusion bodies in nuclei of attacked cells was attributed to retraction of the nucleus away from its membrane. —R.M.

JUSTO, L. F. A., DE LÜCHTER, N. R. L., DEL PINO, M. & CUCULLU, N. L. (1957). Vacuna antirrabica—virus vivo modificado origen embrion de pollo (avianizada) liofilizada. Técnica de su elaboración y control. [**The preparation and standardization of avianized rabies vaccine.**]—*Gac. vet., B. Aires* **19,** 99-107. **2467**

An account of the preparation and control of freeze-dried vaccine prepared from the Flury strain of rabies virus.—R.M.

AKSEL, I. S. & AYKAN, T. B. (1957). Le comportement en culture du tissu cérébral infecté par le virus rabique. L'évolution des corpuscules de Negri in vitro dans le tissu cérébral rabique. [**Behaviour in culture of brain tissue infected with rabies virus. Development of Negri bodies.**] — *Ann. Inst. Pasteur* **93,** 30-35. [Summary in English.] **2468**

The authors attempted to culture brain tissue from rabbits inoculated intracerebrally with rabies street virus. Although all cultured tissue rapidly underwent coagulation necrosis, at least one Negri body remained intact within a degenerated cell after 11 days of culture. Material cultured for 30 days was still infective for rabbits. [See also *V.B.* **26,** 1955.]—R.M.

HABEL, K. (1957). **Rabies antiserum interference with antigenicity of vaccine in mice.** —*Bull. World Hlth Org.* **17,** 933-936. [Summary in French. Author's summary modified.] **2469**

H. described experimental work with mice designed to explore the interference phenomenon noted in human rabies prophylaxis. It was demonstrated quantitatively that when passive antibody from antiserum administration is present, active antibody response is reduced and the production of immunity to virus challenge is affected. The work appeared to confirm that the practice of giving "booster" doses of vaccine after the 10th day of treatment may overcome this interference.

DATT, N. S. & ORLANS, E. S. (1958). **The immunological relationship of the vaccinia and pig pox viruses demonstrated by gel diffusion.**—*Immunology* **1,** 81-86. [Authors' summary.] **2470**

The Ouchterlony double diffusion method in agar gel has been used to study the antigens of the vaccinia and pig pox viruses and their corresponding antibodies. The existence of a common antigenic constituent in the two viruses has been demonstrated. The sensitivity of the method was found to be adequate for sera giving complement fixation titres of 1/80. The complications arising from the presence of antibodies to heterologous (host) antigens are illustrated.

JENSEN, K. E. & PETERSON, W. D., JR. (1957). **Comparative measurements of antigenic differences among human and swine influenza viruses.**—*J. Immunol.* **78,** 365-372. **2471**

This work included a study of 16 strains of swine influenza viruses. Antigenic differences between strains were assessed from "reaction indices", computed by adding the number of antisera in the series which reacted to the strain plus the number of strains inhibited by antiserum prepared with the strain analysed. Swine influenza viruses were more closely related than members of human type A or A^1 strains.—R.M.

JETTMAR, H. M. (1957). Isohämolyse durch das Virus der Zecken-Encephalitis. [**Isohaemolysis by the virus of tick-borne encephalitis.**]—*Z. Hyg. InfektKr.* **143,** 355-363. **2472**

Brain suspensions from mice infected with the virus of a tick-borne meningo-encephalitis, closely related to and resembling Russian spring-summer encephalitis, produced haemolysis in washed mouse r.b.c., but not in those from other mammals and birds. Similarly, haemolysis of mouse r.b.c. was produced with brain material from mice injected intracerebrally with antigen or infected with poliomyelitis, rabies, encephalomyocarditis, toxoplasmosis, and, to a lesser degree, with Ehrlich tumour. There was no haemolysis by material from mice injected with *E. coli* and tetanus toxin.—E.G.

LA MOTTE, L. C., JR. (1958). **Japanese B encephalitis in bats during simulated hibernation.** — *Amer. J. Hyg.* **67,** 101-108. [Author's summary modified.] **2473**

Three species of bats, *Eptesicus fuscus, Myotis lucifugus,* and *Pipistrellus subflavus,* were susceptible to infection with Japanese B encephalitis virus by the subcutaneous route, by mosquito bite, and, in one case, by the oral route. Viraemia lasted for 6 or more days, without clinical illness or pathological changes. The concentration of virus in the blood was generally above the minimal infective dose for mosquitoes. A mosquito–bat–mosquito cycle was

demonstrated. Bats maintained a latent infection for as long as 107 days under simulated hibernation conditions. When they were removed to room temp. no virus was immediately detectable, but in 3 days viraemia developed. The titres after hibernation were above the minimal infective dose level for mosquitoes. A mosquito–bat–mosquito cycle is suggested as a possible overwintering mechanism for this virus.

I. Reeves, W. C., Bellamy, R. E. & Scrivani, R. P. (1958). **Relationships of mosquito vectors to winter survival of encephalitis viruses. I. Under natural conditions.**—*Amer. J. Hyg.* **67**, 78-89. **2474**

II. Bellamy, R. E., Reeves, W. C. & Scrivani, R. P. (1958). **Relationships of mosquito vectors to winter survival of encephalitis viruses. II. Under experimental conditions.**—*Ibid.* 90-100. **2475**

I. Western equine encephalomyelitis virus was isolated from naturally infected *Culex tarsalis* collected in California, in all months of the year except December. The peak incidence of WEE virus in *C. tarsalis* was in May to July. Strains isolated from January to March were non-pathogenic for mice and poorly immunogenic for chickens.

The monthly pattern of the virus isolations correlated closely with the feeding activities of *C. tarsalis*. Virus could not be detected from November 15 to January 15 when blood feeding was minimal. The possibility that a vertebrate host is the immediate source of wintertime vector infection is as likely as the alternative, namely, that virus survives solely in the vector in winter.

II. It was concluded that experimentally infected *C. tarsalis* can carry WEE virus through the winter by serial transmission. However, the experimental model does not exclude the alternative possibility that the virus overwinters in a chronically infected avian host.

—R.M.

Wecker, E. & Schäfer, W. (1957). Eine infektiöse Komponente von Ribonukleinsäure-Charakter aus dem Virus der amerikanischen Pferde-Encephalomyelitis (Typ Ost). **[An infectious ribonucleic acid component of Eastern equine encephalomyelitis virus.]**—*Z. Naturf.* **12b**, 415-417. **2476**

A substance resembling ribonucleic acid was obtained by treatment with phenol of brain from mice which had died from infection with the encephalomyelitis virus. The substance was infectious for mice and chick embryos, although it did not contain intact virus.—R.M.

I. Boulanger, P. (1957). **The use of the complement-fixation test for the demonstration of rinderpest virus in rabbit tissue using rabbit antisera.** — *Canad. J. comp. Med.* **21**, 363-369. **2477**

II. Boulanger, P. (1957). **Application of the complement-fixation test to the demonstration of rinderpest virus in the tissue of infected cattle using rabbit antiserum. I. Results with the Kabete and Pendik strains of virus.** — *Ibid.* 379-388. [Summaries in French.] **2478**

I. Methods of diagnosing rinderpest based on neutralization tests are cumbersome, costly and time-consuming in cases of emergency, and attempts were made to develop a serological test. Attempts to demonstrate the presence of virus and antibodies in the tissues and serum of cattle gave persistently negative results. However complement-fixing antisera of moderately high titre were successfully produced in rabbits; using these antisera, rinderpest virus could be detected in extracted rabbit spleen. The results were considered encouraging and B. discussed the possible use of the rabbit antisera to detect rinderpest virus in the tissues of infected animals or in infected egg material in vaccine production. The positive rabbit sera might also have a place in the indirect c.f. test for the detection of antibodies in sera of cattle recovered from or vaccinated against rinderpest.

II. A high titre rabbit serum obtained following inoculation with the Japanese strain of lapinized rinderpest virus was successfuly employed in a complement-fixation test to detect the presence of virus in bovine tissue. The suspect infected tissue was spleen subjected to acetone–ether extraction and a positive result was demonstrated as early as three days following artificial infection with the Pendik strain of virus. Positive results with the Kabete strain of virus were observed from the fifth day after inoculation. Because of its specificity and the possibility of providing a reliable result within three days or less after receiving the suspicious material, the c.f. test is regarded as a useful and rapid method of diagnosis for rinderpest in cattle.—R. V. L. Walker.

Brotherston, J. G. (1958). **Rinderpest: Some notes on control by modified virus vaccines. III.**—*Vet. Rev. Annot.* **4**, 49-54. [For parts I and II see *V.B.* **27**, 2071.] **2479**

A review of the literature on avianized rinderpest virus.—R.M.

Huck, R. A. (1957). **A mucosal disease of cattle.** — *Vet. Rec.* **69**, No. 49. Pt. 2. pp. 1207-1213. Discussion: pp. 1213-1215. **2480**

H. described the investigation of outbreaks in Gt. Britain of a disease resembling the "mucosal disease" described in North America. The condition, which is probably widespread, occurred at all times of the year in various breeds maintained under varying conditions of management. The outbreaks varied, from a mild transient illness characterized by pyrexia with mucoid nasal discharge and ulceration of the mouth followed by scouring of short duration and having a high morbidity but low mortality, to a severe acute haemorrhagic gastro-enteritis with ulceration of all or part of the alimentary tract occurring in animals 4-18 months old and having a 60% morbidity and very high mortality. Transmission and cross-protection tests in experimental calves showed that immunity was variable and sometimes weak. The experimental disease was very mild. Distinct antigenic differences between strains were not detected. At present the only diagnostic method is by inoculation of calves.—A. ACKROYD.

KUNIN, C. M. & MINUSE, E. (1958). **The isolation in tissue culture, chick embryo and suckling mice of filtrable agents from healthy dairy cattle.**—*J. Immunol.* **80,** 1-11. [Authors' summary.] **2481**

The isolation of eight filtrable agents from apparently healthy dairy cattle in cattle kidney tissue culture has been described. Evidence has been presented that they are viral in nature, serologically similar, fairly widespread in the cattle population and probably of little importance in human disease. Studies with the partition cell in the ultracentrifuge indicate that they are relatively small particles with a sedimentation constant of 150 to 200 Sved. Their host range includes monkey kidney tissue culture, chick embryos and day-old suckling mice. The appearance of melanin-like granules in the amniotic fluid of pigmented Barred Rock chick embryos is of interest. The isolation of many new viral agents by the techniques outlined should be productive.

STAMP, J. T. (1958). **Scrapie disease of sheep. A review of the contradictory evidence as to the nature of the disease.**—*Vet. Rec.* **70,** 50-55. **2482**

Scrapie can be made to occur in Cheviot and Blackface sheep and in goats within a constant period of months by subcutaneous, intracerebral and intradermal inoculation of filtered brain material from infected sheep and goats and can be transmitted in series. The transmitting agent is resistant to temperatures of 100°C. for a considerable period and to 0·35% formalin and is therefore probably not an orthodox virus. The finding of extensive lesions of myopathy by Bosanquet *et al.* [*V.B.* **27,** 1856], which suggested that the disease is of genetical origin, has not been confirmed by other investigators. In the absence of complete examinations of the central nervous system, it is difficult to accept that the muscle lesions found were in fact primary.—A. ACKROYD.

PALMER, A. C. (1957). **Studies in scrapie.**—*Vet. Rec.* **69,** No. 49. Pt. 2. pp. 1318-1324. Discussion: pp. 1324-1328. **2483**

Some of the clinical signs believed to be important in the diagnosis of scrapie are described and evidence is presented that the cytological changes in the nerve cells in the form of vacuoles containing eosinophilic bodies are associated with the disease and are of significance. Twenty cases, including 2 sheep and 2 goats to which the disease was transmitted by inoculation, were studied. One of the most important early signs is irritation which induces the animal to rub itself and nibble its skin. The nibble response can be influenced by external factors. Injection of various drugs into the lateral ventricle did not produce signs of irritation in normal sheep. Other symptoms include tremors of two kinds, an intermittent nodding of the head, and a violent incoordinated jerking of the limbs and head; hyperexcitability; abnormal gait; postural nystagmus; and debility. Vacuolation of neurones was observed irrespective of the fixation method. It was much more abundant in scrapie affected animals than in normal controls or sheep with nervous diseases and was most intense in the lateral cuneate nucleus, the lateral caudate nucleus of the reticular formation and adjacent nuclei whilst in the controls, vacuolation was usually in the nerve cells of the dorsal motor nucleus of the vagus. Neurones of paired nuclei were affected to the same extent on both sides. No neuroglia reaction was observed but extracellular round bodies were found in the region of intense vacuolation. Early signs of scrapie could be present without intense vacuolation. Widespread myopathic lesions could not be demonstrated.—A. ACKROYD.

SHOPE, R. E. (1958). **The swine lungworm as a reservoir and intermediate host for hog cholera virus. I. The provocation of masked hog cholera virus in lungworm-infested swine by ascaris larvae.**—*J. exp. Med.* **107,** 609-622. **2484**

Shope considers that the history and epidemiology of swine fever indicate that a

reservoir host, other than the pig, is necessary for the perpetuation of the virus.

In emphasizing the reasons which have led him to this conclusion he cites the seasonal incidence of swine fever [in the U.S.A. presumably] from August to the end of November. The authority quoted by S. for the statement that swine fever is seasonal is Van Es (1952) in his text-book "The principles of animal hygiene and preventive veterinary medicine." Van Es certainly comments on the seasonal fluctuation and gives a graph which indicates that the average number of outbreaks of swine fever has a low point of 10 in January and a high point of 55 in October but in no month of the year is the disease absent from the U.S.A. Possibly these seasonal fluctuations are a reflection of the fluctuations in the swine population?

S. then postulates that the lungworm of the pig is a likely reservoir host and cites experiments in which earthworms were infected with lungworm larvae obtained from adult lungworms collected from pigs affected with swine fever. The earthworms infected with lungworms were then fed to young pigs. In all 282 pigs were fed in this manner over a period of 4 years. Of the 282 two "came down with cholera". The diagnosis seems to have been based on post-mortem findings after the pigs had been slaughtered. The post-mortem findings are not described but are stated to have been "typical of hog cholera". There is no mention of any controls.

Had the work rested at this point one might reasonably hazard two possible explanations (a) that the two cases which occurred were the result of accidental infection as a result of some flaw in isolation or (b) that an infective dose of virus may exceptionally remain viable in or on lungworm larvae for at least two months.

S. however goes on to state that many of the remaining 280 which did not develop swine fever after being infected with lungworm larvae must have harboured the virus in a latent or "masked" form and had become carriers of "hog cholera virus of a non-pathogenic and non-immunogenic character".

This 'masked' virus could be provoked to pathogenicity by appropriate measures. The appropriate measure which was used experimentally was the feeding of embryonated ascaris ova to the pigs. By this procedure it is claimed that swine fever was provoked in 13 out of 149 pigs. The 149 attempts were spread over 4 years. The 13 successes all occurred during the 5 months January to May, none during the 7 months June to December. It is not stated if the 13 successes occurred during one year or whether they were spread over the four years of experimentation.

These claims are of such a revolutionary nature and could have such wide implications on the control of swine fever that it would be unwise to accept them unreservedly until such time as the work can be repeated under very strictly controlled conditions and with every possible precaution to avoid any risk of accidental introduction of infection or of erroneous diagnosis. The diagnosis of swine fever from clinical signs and post-mortem findings, especially in pigs which have been slaughtered before the disease has reached its terminal stages, is liable to error and one would have liked to have the diagnosis confirmed (a) by inoculation of susceptible and immune pigs and (b) by serological methods such as the double diffusion precipitin test.

If Shope's conclusions are correct it is difficult to explain how swine fever has been eradicated from such countries as Australia, why the incidence is so low in Canada, and why the incidence in Gt. Britain fell away to practically nothing during the second world war and the immediate post war period when imports of bacon were so severely restricted.

Bobrov, P. F., Okuneva, V. V. & Dudorova, E. P. (1956). **[Utilization as an antigen of blood, treated with crystal violet, from pigs with swine fever.]**—*Trud. gosud. nauchno-kontrol. Inst. po Vetpreparatam* **6,** 97-100. [In Russian.] **2485**

Preliminary experiments indicated that blood from artificially infected pigs, treated with crystal violet but unsuitable [for unstated reasons] for use as vaccine, could be used to hyperimmunize pigs for serum production after the blood was inactivated by heating at 37° to 38°C. for 14–20 days.—R.M.

Mihajlovic, S. (1957). La prophylaxie de la peste porcine en Yougoslavie. **[Immunization against swine fever in Yugoslavia.]** — *Bull. Off. int. Epiz.* **48,** 409-418. [Summary in English.] **2486**

In 1956 846,000 pigs were inoculated with crystal violet vaccine and 1·6 million were inoculated with lapinized virus. Swine fever was present on 816 farms in 1956, compared with 4,128 farms in 1954. Control measures included the slaughter of infected pigs.—R.M.

Larski, Z., Szaflarski, J. & Szurman, J. (1958). Badania nad biologią wirusa choroby

cieszyńskiej świń (Doniesienie II). **[A study of the biology of Teschen disease virus. II.]** —*Méd. vét., Varsovie* **14,** 2-5. [In Polish. Summaries in English and Russian.] **2487**

Attempts to adapt the virus to young rabbits receiving cortisone and to new-born mice failed. I/m administration of cortisone to pigs shortened the incubation period by 1 day but did not alter either the clinical symptoms or the histopathological lesions. There was no difference in susceptibility to Teschen disease between pigs from the Teschen district and pigs from another part of the country. Attempts at haemagglutination, complement-fixation and precipitin tests failed. Electrophoretic examinations of sera from infected and immunized pigs revealed a non-specific fall in albumin.
—M. Gitter.

Kersting, G. & Pette, J. (1957). Zur experimentellen Pathologie der Teschener Krankheit. **[Experimental pathology of Teschen disease.]**—*Virchows Arch.* **330,** 106-118. **2488**

Of six piglets, 4–6 weeks old, three were infected intracerebrally with 0·5 ml. of Teschen disease brain material suspended in 50% glycerol, one was given 1 ml. into the lumbar subarachnoid space and two were injected with 1 ml. into the sciatic nerve. After about 6 days typical symptoms of the disease appeared in the piglets infected intracerebrally and subarachnoidally. Of the two injected into the sciatic nerve one developed a mild form of the disease, accompanied by signs of paresis, the other remained apparently healthy for a period of observation of 30 days. P.M. the first four had brain and cord lesions typical of Teschen disease; in the fifth, typical lesions in cord and brain stem were present, but to a lesser degree. Apart from degenerative and inflammatory lesions there were marked changes in the cranial motor cells of the horns and there was perivenous striated glia proliferation in the white fasciculi of the dorsal column of the cord.—E.G.

Strohmaier, K. & Zimmermann, T. (1958). Die Bestimmung der Sedimentationskonstante des Virus der ansteckenden Schweinelähmung (Teschener Krankheit). **[Sedimentation constant of the virus of Teschen disease.]**—*Z. Naturf.* **12b,** 234-237. **2489**

The sedimentation constant was 136 S. This was equivalent to a virus particle size of 31 mμ.—R.M.

Fujimoto, Y. (1957). **Studies on infectious canine hepatitis. I. Histopathological studies on spontaneous cases.**—*Jap. J. vet. Res.* **5,** 51-70. [In English.] **2490**

F. examined in detail organs and tissues from 11 dogs and 3 foxes with virus hepatitis.
—R.M.

Osamura, K., Hirato, K., Shimizu, K. & Soekawa, M. (1957). **Studies on *Hepatitis contagiosa canis*. I. Infection experiments on dogs with two strains of the virus and serological investigations with the complement-fixation test.**—*Jap. J. vet. Res.* **5,** 27-38. [In English.] **2491**

Of 2 strains of canine virus hepatitis isolated in Japan, one underwent 4 serial passages in puppies, causing fatal infection in 8 out of 20 puppies in the first 3 passages, but only mild infection in the 4th passage. Of 10 puppies inoculated with the second strain 6 developed mild infections and 4 were unaffected, remaining negative to the c.f. test. The clinical symptoms were variable, even in puppies of the same litter. C.f. antibody appeared between 12 and 15 days after infection. Of 374 dogs from 4 districts 50% were positive to the c.f. test for canine virus hepatitis.—M.G.G.

Jacotot, H., Vallée, A. & Virat, B. (1958). Sur la conservation dans les peaux des mutants atténués du virus du myxome. **[Preservation in desiccated rabbit skins of attenuated mutants of myxoma virus.]**—*Ann. Inst. Pasteur* **94,** 502-504. [English summary modified.] **2492**

Attenuated mutants of myxoma virus survived several months in skins turned inside out and exposed to the air. The longest periods observed have been five months for the neuromyxoma virus and four months for a strain isolated in France. These survival times are shorter than those obtained with the classical virus, but the attenuated virus can certainly persist a long time at the site of a lesion, as evidenced in the case of neuromyxoma.

Jacotot, H., Vallée, A. & Virat, B. (1957). Incidence de la quantité de virus inoculée sur l'évolution de la myxomatose expérimentale. **[Influence of the amount of virus inoculated on the evolution of experimental myxomatosis.]**—*Ann. Inst. Pasteur* **92,** 262-266. **2493**

Neither the clinical form nor the duration of experimental myxomatosis was influenced by the dose of virus inoculated, but the incubation period decreased as the dose of virus increased, whether the virus was fully virulent or attenuated.—R.M.

Chaproniere, D. M. & Andrewes, C. H. (1958). **Factors involved in the susceptibility of tissues of various species to myxoma virus.**

—*Virology* **5,** 120-132. [Authors' summary modified.] **2494**

Myxoma virus will grow in cultivated tissues from normally resistant species, and also in homografts of such tissues [see *V.B.* **28,** 1437]. Possible factors determining the difference between the tissues of resistant species *in situ* in the animal, and in culture were investigated. They did not seem to be antibody induction, presence of inhibitors, vascularization, degree of organization, or inability of the virus to penetrate cells. Other possibilities are discussed. The virus survived longest and perhaps multiplied best in tissue grafted away from its normal position and better in homografts than in autografts. In a few experiments, adenovirus type 5 behaved like myxoma. Fibroma virus, on the other hand, failed to multiply in grafts.

MAREK, K. (1957). Immunologiczne właściwości krajowych szczepów pomoru rzekomego kur w porównaniu ze szczepem Hertfordshire. **[Immunological properties of strains of Newcastle disease virus isolated from natural outbreaks as compared with the Hertfordshire strain.]**—*Roczn. Nauk rol.* Ser. E. **68,** 25-38. [In Polish. Summaries in English and Russian.] **2495**

M. isolated 12 strains of Newcastle disease virus from natural outbreaks and although the strains differed as regards virulence, clinical symptoms, the course of the disease and P.M. findings, they could all be neutralized by the serum of the Hertfordshire strain used for vaccine production. He considers that post-vaccination outbreaks are mainly due to technical errors at vaccination. For the haemagglutination test the r.b.c. should be collected from healthy birds free from intestinal parasites.—M. GITTER.

TIEFENBACHER, H. & WOERNLE, H. (1957). Über die Einschleppung der atypischen Geflügelpest (Newcastle-Disease) durch Einfuhrprodukte. **[Introduction of Newcastle disease by imported products.]** — *Mh. Tierheilk.* **9,** 157-164. **2496**

Newcastle disease virus was demonstrated in eggs imported from Czechoslovakia and Yugoslavia, and haemagglutination titres against the virus were demonstrated in the yolk of eggs imported from these two countries and from Belgium and Poland, but not in eggs imported from Holland. The virus was isolated from the brain of 14 out of 35 frozen fowls in one consignment and 3 out of 30 in another, imported from Hungary. Six of the isolated strains were inoculated into fowls; 4 were pathogenic, but 2 were non-pathogenic and were possibly vaccinal strains. Imported feathers were negative for the virus, but *Salmonella typhi-murium* was isolated from a consignment imported from China.—M.G.G.

ZSIGMOND, L. & GYÖRGY, H. (1957). Gyakorlati módszerek a baromfipestis fertőzőanyagának elhatárolására és megsemmisítésére. **[Practical control of Newcastle disease.]** — *Mag. állator. Lapja* **12,** 316-324. [In Hungarian. Summaries in English and Russian.] **2497**

In a Co-operative Poultry Farm and Factory which collected poultry from three and a half counties of Hungary observations on the incidence of Newcastle disease revealed that, while in 1954 61% of the deaths which occurred were due to this disease, in 1956 the proportion fell to 0·3%. This precipitous fall was partly due to a strictly controlled, nation-wide, compulsory vaccination campaign using the Hertfordshire strain of virus, partly to a thorough veterinary and police control rigorously carried out. An exhaustive account is given of the methods of tracing the foci of infection, the preventive hygienic measures, propaganda and compulsive methods of obtaining the collaboration of the poultry producers to ensure 100% mass vaccination of poultry and control of the marketing.—A. SEBESTENY.

DHANDA, M. R., NILAKANTAN, P. R. & PATURI, S. (1958). **Immunization of fowls with combined fowl pox and Ranikhet (Newcastle) disease vaccine.**—*Indian vet. J.* **35,** 5-11. **2498**

The immunity response in chicks vaccinated by the 'prick' method with a mixture of Newcastle disease and fowl pox freeze-dried chick-embryo vaccines was comparable with that in chicks inoculated with either vaccine alone, as judged from results of challenge with virulent virus in both cases and in addition from haemagglutinin-inhibition titres in the case of Newcastle disease.—R. N. MOHAN.

LEVINE, S. (1958). **Dynamics of heterologous interference between viable viruses in chick embryo fibroblast monolayers.**—*Virology* **5,** 150-167. [Author's summary modified.] **2499**

Western equine encephalomyelitis virus (WEE) depressed the production of Newcastle disease virus (NDV) in chick embryo fibroblast monolayers even if added as late as 5-6 hours after the cells had been first infected with NDV. Single-cell experiments indicated that, 5 to 6 hours after infection with NDV, the majority of cells have passed through the latent period for NDV production. The ability of NDV-infected cells to produce WEE decreased exponentially with time after NDV infection. Evidence is

presented suggesting that the reduced yield of WEE was due to a reduction in the amount produced by each cell. This is discussed in relation to the site of interference. In contrast to NDV-infected cells, cells infected with the PR8 strain of influenza virus did not lose their ability to produce WEE for 4 to 5 hours. This period of normal WEE yield was followed by one of continuous decline in WEE production.

WECKER, E. & SCHÄFER, W. (1957). Studien mit ^{32}P-markiertem Virus der Klassischen Geflügelpest. I. Mitteilung: Untersuchungen über das Verhalten des Virus beim Eindringen in die Wirtszelle. **[Studies of fowl plague virus labelled with ^{32}P. I. Behaviour when penetrating the host cell.]**—*Z. Naturf.* **12b,** 483-492. **2500**

In extracts from chick embryo cells infected with labelled virus there was a radioactive component which sedimented slower than the virus particles. Some of this component consisted of "bound antigen" and the rest of phospholipids, substances soluble in trichloracetic acid, and ribonucleic acid. The free ribonucleic acid may have been derived from "bound antigen" or may be of viral origin.—R.M.

BOYD, R. J. & HANSON, R. P. (1958). **Survival of Newcastle disease virus in nature.**—*Avian Diseases* **2,** 82-93. [Authors' summary modified.] **2501**

The survival of Newcastle disease virus (NDV) in some of the substrates that might be concerned in natural transmission was investigated. These were sterile and non-sterile soils, water, earthworms, and planaria. The survival of NDV in paper disks at 20°±2°C. and at three degrees of relative humidity served as a control.

NDV seeded in sterile and non-sterile soils maintained at 20°±2°C. and at 100% R.H. survived for 22 days. Virus survived equally well for 8 days at zero, 15 and 100% R.H. and considerable residual moisture remained in the soil. NDV in sterile and non-sterile soils at zero and 15% R.H. was inactivated between 8 and 15 days when the soil became dry in contrast to virus held at those conditions in paper disks. The difference in length of survival of virus in paper discs and in soil was possibly caused by the slow rate of change of the virus from the wet to the dry state in the soil preparations and the rapid change in paper preparations. The inactivation of the virus was not significantly different in sterile and non-sterile soils.

The survival of NDV in water was adversely affected by aeration and lack of salts and organic matter.

NDV fed to earthworms (*Helodrilus*) was inactivated more rapidly than virus inoculated into the coelom. NDV fed to planaria (*Planaria maculata*) held at 31°C. was inactivated more rapidly than in planaria held at 20°±2°C. The virus appears to be destroyed by the digestive or assimilative processes of the invertebrates.

I. WILSON, D. & POLLARD, E. (1958). **Radiation studies on the infective property of Newcastle disease virus.**—*Radiation Res.* **8,** 131-141. **2502**

II. WILSON, D. (1958). **Radiation studies on the hemolysin of Newcastle disease virus.**—*Ibid.* 142-149. [Authors' summaries modified.] **2503**

I. Inactivation of the infectivity of Newcastle disease virus was studied with fast charged particles and slow electrons. The results of proton, deuteron, and α-particle bombardment indicate that the total radius of the virus is at least 510 Å, and that there is a spherical radiation-sensitive region 280 Å in radius. The results of slow electron bombardment show that the radiation-sensitive region is surrounded by a radiation-insensitive coat 230 Å thick.

II. Ionizing radiation studies on the haemolysin of Newcastle disease virus indicate that this property resides in about 15 independent targets. If it can be assumed that these haemolysin molecules are flat plates, they will be 100 to 140 Å in radius and 20 Å thick. Fifteen such molecules arranged on the virus surface would cover 15% to 30% of the total surface area.

SIMPSON, R. W. & GROUPÉ, V. (1958). **Influence of temperature on virulence and growth of avian bronchitis virus in eggs.**—*Fed. Proc.* **17,** 535. [Authors' abst. modified.] **2504**

Incubation temperatures exerted a marked effect on the growth, virulence and population changes of avian bronchitis virus in embryonated eggs. The stable egg-adapted Beaudette strain (A) killed embryos within 30–48 hours when injected into the allantoic sac (AS) of eggs subsequently incubated at 34° and 38°C. Successful adaptation of the A strain to the brain of unweaned mice resulted in the gradual emergence of a viral population which, after 25 serial brain passages, was lethal for eggs at 34°C. within 48 hours but which produced scattered mortality at 38°, most deaths occurring between the 3rd and 6th day. Conversely, when the A strain was passaged serially in the AS of eggs at 38°C. a subline was obtained that

rapidly killed eggs at 38° but not until the 3rd or 4th day at 34°. One recently isolated strain (B) was lethal for eggs at 38° but not at 34°. Viral growth at 34° could be followed by egg titration at 38° or by interference, at 34° using the A strain as challenge virus. Growth studies revealed that the B strain reached the same maximum titre in eggs at 34° and 38° but that it required about 36 hours longer to reach this level at 34°. Attempts to adapt the B strain to unweaned mice failed.

BENEDICT, A. A. & O'BRIEN, E. (1958). **A passive hemagglutination reaction for psittacosis.**—*J. Immunol.* **80,** 94-99. [Authors' summary modified.] **2505**

Sheep erythrocytes treated with tannic acid were sensitized with a soluble antigen sedimented at 100,000 × G for 80 min. from allantoic fluid infected with a meningo-pneumonitis virus isolated from ferrets by Francis & Magill (1938). Agglutination of sensitized cells was demonstrated with antisera from 22 of 31 people who had experienced infections with psittacosis one to five years previous to tests. Four of 29 supposedly normal human sera manifested haemagglutinins. Substances responsible for non-specific haemagglutination by normal human sera were adsorbed from the antigen preparation with untanned sheep erythrocytes. Evidence was presented that the haemagglutination and complement-fixation reactions measured different antibodies. Haemagglutinating antibodies were adsorbed from rabbit antipsittacosis sera with meningo-pneumonitis sensitized cells and complement-fixing antibodies were not removed by this treatment. The sensitizing antigen was not associated with either complement-fixation activity or with the murine haemagglutinin.

DAVIS, D. E., WATKINS, J. R. & DELAPLANE, J. P. (1958). **Research note—The ineffectiveness of furazolidone as a prophylactic agent against turkey ornithosis.**—*Avian Diseases* **2,** 117-119. [Authors' summary modified.] **2506**

Furazolidone had no prophylactic value against psittacosis in turkey poults.

SCHYNS, P. (1957). L'hépatite à virus du caneton. **[Duck virus hepatitis.]**—*Ann. Méd. vét.* **101,** 264-271. **2507**

A virus was isolated from ducklings imported into Belgium from the Netherlands, which died 1 or 2 hours after the first signs of an illness manifested by depression followed by incoordination and opisthotonos with extension of the limbs behind the body. The virus was passaged in embryonated eggs and it caused macroscopic and histological changes in the embryos similar to those previously described for duck virus hepatitis.—R.M.

QUIROZ, C. A. & HANSON, R. P. (1958). **Physical-chemical treatment of inocula as a means of separating and identifying avian viruses.**—*Avian Diseases* **2,** 94-98. [Authors' summary modified.] **2508**

Three strains of Newcastle disease virus, two of fowl pox, two of laryngotracheitis, one of infectious bronchitis and one of a virus isolated by Crawley in Ontario, were subjected to physical-chemical treatment. Heating at 56°C., exposure to a pH of 2 and to 1% cresol destroyed the represented strains of one or more viruses. Treatment with 1% NaOH, 20% ethyl ether, 1% phenol and 50% glycerol destroyed one or two strains of several viruses but did not eliminate any single virus. Certain mixtures of avian viruses could be resolved by treating the inoculum.

HABEL, K., HORNIBROOK, J. W., GREGG, N. C., SILVERBERG, R. J. & TAKEMOTO, K. K. (1958). **The effect of anticellular sera on virus multiplication in tissue culture.**—*Virology* **5,** 7-29. [Authors' summary modified.] **2509**

Viruses causing a cytopathogenic effect in tissue cultures can be non-specifically inhibited by anticellular sera. Different viruses vary in susceptibility and for certain viruses greater inhibition can be demonstrated in a cell system homologous for the anticellular serum. However, the phenomenon is not strictly species-specific, for immune serum against human cells inhibits virus in monkey kidney tissue culture. The immune sera act on the cell and not on the virus. Their inhibitory activity can be removed by adsorption with r.b.c. or the proper tissue cells. Limited evidence suggests that the action takes place at the surface of the cell or in the cytoplasm. Cross reactions in neutralization tests employing standard typing sera may be caused by this phenomenon.

HAUSSMANN, H. G. & GRAFE, A. (1957). Virucide Desinfektionsmittelwirkung und Hämagglutinintest. **[Viricidal disinfectants and haemagglutination.]**—*Z. Hyg. InfektKr.* **143,** 334-342. **2510**

GRAFE, A. & HAUSSMANN, H. G. (1957). Über eine für die Desinfektionsmittelprüfung optimal geeignete Methode zur Züchtung des Influenza, Mumps- und Newcastle-Virus im Allantoissack des Hühnerembryos. **[A method for growing influenza, mumps and Newcastle**

disease virus in the allantoic sac of chick embryos, suited for the evaluation of disinfectants.]—*Ibid.* 343-354. **2511**

I. Viricidal action of three disinfectants containing phenol derivatives and one containing chlorine and cresol was tested against the viruses of influenza A, mumps and Newcastle disease in allantoic fluid. There was a close relationship between viricidal action and the action on the virus haemagglutinins. The practical value in the evaluation of disinfectants, of the lowering effect the disinfectants had on the haemagglutination titre, was studied.

II. Optimal circumstances for harvesting of influenza A, mumps and Newcastle disease virus from the allantoic sac of infected chick embryos were investigated. Best results were obtained for influenza and mumps virus with chick embryos 11 and 7 days old, and a 1:100,000 dilution of infected allantoic fluid, whereas for Newcastle disease the most suitable dilution was 1:1000, using chick embryos 11 days old.

Because of the relatively high mortality among chick embryos, for evaluation high dilutions of disinfectants were preferable. The authors stated that it must be remembered when testing the viricidal activity of disinfectants by the chick embryo method that allantoic fluid virus suspensions, as compared with organ virus suspensions, contain very little protein and that efficacy of a disinfectant is reduced by the presence of protein in virus suspensions.—E.G.

SOBĚSLAVSKÝ, O. (1957). Experimentální infekce kura domácího (*Gallus gallus domesticus*) *C. burneti*. **[Experimental infection of the domestic fowl (*Gallus gallus domesticus*) with *Rickettsia burneti*.]** — *Čsl. Epidemiol., Mikrobiol., Imunol.* **6,** 146-151. [In Czech. Summaries in English and Russian.] **2512**

Rickettsia burneti was demonstrated in the faeces of five fowls 14–42 days after experimental infection. There were no clin. symptoms. In organs, *R. burneti* persisted for about five months and in one fowl it was demonstrated in the blood. Complement-fixing antibodies, although at low titres, were demonstrated from the third week until about the 40th day. *R. burneti* was also isolated from six embryos from 13 fertile eggs, laid 19–42 days after infection, and also from three of four chicks which had been allowed to hatch. In two of these there was paresis and development was retarded as compared with normal controls. The possible role of domestic fowls in the epidemiology of Q fever was discussed.—E.G.

RAGHAVACHARI, K. & REDDY, A. M. K. (1958). ***Rickettsia canis* in Hyderabad.**—*Indian vet. J.* **35,** 63-68. **2513**

A note on the occurrence of *R. canis* infection in dogs. The organism could be transmitted to puppies through blood inoculation, but the infection remained inapparent. Terramycin was the drug of choice for treatment.

—R. N. MOHAN.

See also absts. **2552** (Rous sarcoma); **2554** (avian leucosis complex); **2608** (effect of Ascaridia galli infestation on chicks with infectious bronchitis); **2703** (report, Kenya); **2704** (report, Trinidad & Tobago).

IMMUNITY

COOMBS, R. R. A. (1957). **The role of immunology in biology and medicine.**—*Vet. Rec.* **69,** No. 49. Pt. 2. pp. 1309-1313. **2514**

The increasingly important part that immunology is playing in biology and medicine is illustrated by a brief review of various facets of the subject. This includes the use made of characterized antisera for the recognition of antigens, the animal blood groups, the problems associated with skin grafting and the phenomenon of actively acquired tolerance, gel diffusion, the detection of antibodies using known antigens, the study of blood dyscrasias with a suspected immunological basis and auto-antibodies in disease, the investigation of antigen–antibody-like reactions, and finally immunity, immuno-therapy, and allergic phenomena.

—A. ACKROYD.

KORNGOLD, L. & VAN LEEUWEN, G. (1958). **Formation by one antigen of multiple zones of precipitate in double gel diffusion: an immunological explanation.**—*Fed. Proc.* **17,** 521. [Authors' summary modified.] **2515**

An explanation based on and consistent with immunochemical theory can be given for the formation of 2 precipitin lines with 1 antigen and its homologous antibody in the double gel diffusion technique. This phenomenon is observed when either antigen or antibody is in excess. Under these conditions a precipitate forms in the region of the reagent in excess. This reagent, or the remaining soluble antigen-antibody complex, will diffuse beyond the edge of this precipitin line and either will be precipitated right at the edge, thereby broadening the line, or will diffuse a slight distance beyond the precipitate before forming a second line. A second line will then be formed if the rate of precipitation is slower than the rate of diffusion of either the soluble reagent or antigen-antibody complex. Theoretically, a precipitating system

in antigen excess should result ultimately in one line since, in the region of antigen excess, the first precipitate should dissolve. In practice this happens rarely.

SPEIRS, R. S. (1958). **Relation of eosinophils to formation of antibody.**—*Fed. Proc.* **17,** 154. **2516**

S. defined 4 stages in the response of eosinophile leucocytes to antigen. He suggested that eosinophiles react with antigen to form an enzymic template, which is utilized by macrophages to form antibody.—R.M.

AUDRAN, R. (1958). Détermination du taux du complément dans différentes espèces animales. **[Determination of complement titre in different animal species.]**—*Ann. Inst. Pasteur* **94,** 541-545. [English summary modified.] **2517**

The complement titre was determined in 19 animal species (including domesticated mammals and birds) by means of the haemolysis method. In the haemolytic system used, sheep erythrocytes were sensitized by a horse haemolysin. The results show a great variability of the complement titre according to the animal species, ranging from 0 to 200 units. The figures were compared with those given by Hegedius & Greiner (1938) and by Rice & Crowson (1950).

GOLDWASSER, R. A. & SHEPARD, C. C. (1958). **Staining of complement and modifications of fluorescent antibody procedures.**—*J. Immunol.* **80,** 122-131. [Authors' summary.] **2518**

A modification has been developed of the procedure for conjugating antisera with fluorescein. This involves the use of fluorescein isocyanate impregnated filter discs and labelling is carried out without the use of organic solvents.

The quality of the conjugate is determined by spectrophotometric determination of the fluorescein and protein contents. A fluorescein : protein ratio of $3{\cdot}8–5{\cdot}5 \times 10^{-3}$ indicates satisfactory conjugation, whereas lower ratios give less satisfactory staining.

It has been shown in a variation of the indirect staining procedure that guinea pig complement can be used in the staining of several antigens in combination with antisera from various animal species. Only one conjugate is, therefore, needed for the visualization of antigens which, in combination with antibody, will fix complement. The role of the various components of complement in the staining reaction was investigated and no evidence was found for the fixation of C/3. C/1, C/2 and C/4, all had to be present simultaneously for full staining to occur and no evidence was found for attachment of midpiece in the absence of endpiece nor of endpiece in the absence of midpiece.

HENRY, S. S. & VAN DYKE, H. B. (1958). **A study of the antibodies produced in response to purified preparations of sheep interstitial cell stimulating hormone.**—*J. Endocrin.* **16,** 310-325. [Authors' summary modified.] **2519**

Antibodies formed in rabbits in response to purified preparations of sheep interstitial cell stimulating hormone (ICSH) were studied by the Ouchterlony technique for the analysis of precipitins. ICSH precipitin was identified *in vitro*. The antibody to sheep ICSH formed precipitin bands with sheep ICSH and with ox ICSH, but not with pig ICSH or with human chorionic gonadotrophin (HCG). Immune serum against sheep ICSH, absorbed so that a single demonstrable antibody was present, inhibited the biological effect of sheep and of ox ICSH but not of pig ICSH or of HCG. This serum did not interfere with the action of endogenous rat ICSH. There was no cross-reaction between the sheep ICSH antigen–antibody system and the pneumococcus polysaccharide type XIV system, as has been reported for the antigen–antibody system of HCG.

WROBLEWSKI, A., PODLIACHOUK, L. & MILLOT, P. (1958). Recherche de substances de groupes sanguins dans le sérum et la salive des bovins. **[Examination of bovine serum and saliva for the presence of soluble blood group substances.** — *Ann. Inst. Pasteur* **94,** 456-462. [English summary modified.] **2520**

Saliva of 76 cattle was examined for the presence of blood group substances. Bovine J antigen and human A antigen were found in saliva and their amount was sometimes higher than in serum. There was a close relationship between the salivary level of these substances and the J group of the animals: J^{cs} animals possessed higher salivary levels than J^{s} animals. Group j^{a} animals seldom secreted these substances and only in small amounts. It was not possible to demonstrate in cattle saliva bovine AOF and human B antigens in soluble form.

DIXON, F. J., WEIGLE, W. O. & VAZQUEZ, J. J. (1958). **Secretion of serum proteins by the bovine udder.**—*Fed. Proc.* **17,** 509. [Authors' abst. modified.] **2521**

The mechanism of γ-globulin or antibody secretion in colostrum is still in dispute. Metabolic studies indicate that the antibody comes from the blood, while some morphological observations suggest origin from plasma cells in the udder. In the present experiments the con-

centrations of serum albumin, γ-globulin, and specific antibody in blood, milk and colostrum of cows were determined immunochemically. Also immunohistochemical study of biopsy specimens of the udders was made. The histological and immunohistochemical observations did not reveal a significant number of plasma cells or other cells containing γ-globulin in the stroma of the colostrum-secreting bovine udder. There was, however, a marked concentration of globulin or antibody but not albumin in the glandular epithelium of the udder and in the colostrum. Human gamma globulin transfused 1–2 weeks before delivery was also concentrated in the colostrum, while human albumin similarly transfused was not. Metabolic studies revealed a relatively constant rate of loss of globulin into the udder during the periods of colostrum formation and lactation. Based on a period of 17 days of constant accumulation of colostrum before the delivery, the daily deposit of globulin in the colostrum is about the same, or only slightly greater than, the amount lost daily in milk after delivery. In view of this similar rate of loss of globulin into the udder during colostrum formation and lactation, it would seem likely that a similar mechanism of globulin secretion might operate during both periods. It is of interest that the amount of globulin lost into the udder during colostrum formation and lactation is considerably greater than the amount catabolized in the plasma protein pool.

See also abstr. **2398** (whole-blood agglutination in avian TB.); **2399** (antigenic relationship in strains of tubercle bacilli); **2400** (tuberculopolysaccharide); **2404** (glanders); **2414-2422** (brucellosis); **2423-2424** (leptospirosis); **2433** (botulism); **2449** (bovine contagious pleuropneumonia); **2456** (dourine); **2462-2464** (F. & M. disease); **2467-2469** (rabies); **2470** (relationship between vaccinia and swine pox); **2471** (human and swine influenza); **2477-2479** (rinderpest); **2485-2486** (swine fever); **2491** (Rubarth's disease); **2495-2503** (Newcastle disease); **2505** (psittacosis); **2547** (helminths).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

WILSON, H. G., KELLER, J. C. & SMITH, C. N. (1957). **Control of fleas in yards.**—*J. econ. Ent.* **50**, 365-366. **2522**

Dog kennels and pens heavily infested with fleas were sprayed with various insecticides at the rate of 1 gal. per 1,000 sq. feet. A coarse nozzle capable of spraying for at least 25 feet ensured that all inaccessible areas were treated. All the insecticides except D.D.T. gave 99-100% control for 7-9 weeks in some or all of the tests. It is considered that failures in control are often due to faulty application of the insecticide.

—M.G.G.

SHANAHAN, G. J. (1958). **Resistance to dieldrin in *Lucilia cuprina* Wied; the Australian sheep blowfly.**—*Nature, Lond.* **181**, 860-861. **2523**

Field inquiries revealed that insecticidal resistance in *L. cuprina* may have been acquired. Laboratory experiments showed that the LD_{50} for sensitive flies was approx. 0·025 μg. of dieldrin per fly whereas for resistant flies the figure was between 1·25 and 2·5 μg. A complete hatch of flies was obtained from prepupae of the resistant strains after immersion in 0·5% dieldrin, but no flies emerged from prepupae of the normal strain following treatment with 0·05% dieldrin.—D. POYNTER.

BROWN, L. B. (1958). **The frequency of mating of the Australian sheep blowfly, *Lucilia cuprina*.**—*Aust. J. Sci.* **20**, 185. **2524**

In lab. experiments designed to test the frequency of mating of *L. cuprina* it was found that virgin females mated readily, and 4-day-old virgin females mated more readily than 10-day-old virgin females. Females which had been previously mated resisted the males and only a few mated again. Individual males were able to mate with a number of females in a comparatively short period. These observations suggest that female *L. cuprina* mate only once in the field.—N. P. H. GRAHAM.

GRANETT, P. & HANSENS, E. J. (1957). **Further observations on the effect of biting fly control on milk production on cattle.**—*J. econ. Ent.* **50**, 332-336. **2525**

Three small dairy herds were each divided into 3 equal groups of 4-6 animals; one group was sprayed once or twice weekly for 6 weeks with an emulsion containing 0·5% methoxychlor, one with an emulsion containing 0·5% methoxychlor plus 5% butoxy polypropylene glycol, and one was left untreated. Treated cows had far less flies than untreated and, on a farm situated near marshland where mosquitoes abounded, the treated cows yielded, in an average week, 36 lb. of milk more per animal than controls. Butoxy polypropylene glycol increased the effectiveness of the spray. Excellent fly control was achieved in a fourth herd of 18 cows, treated once a week with wettable powders of methoxychlor or methoxychlor plus butoxy polypropylene glycol, applied dry or dispersed in water. The findings confirmed those of a previous trial [see *V.B.* **27**, 803].—M.G.G.

CUTKOMP, L. K. & HARVEY, A. L. (1958). **The weight responses of beef cattle in relation to control of horn and stable flies.** — *J. econ.*

Ent. **51,** 72-75. [Authors' abst. modified.] **2526**

Oil formulations of repellent insecticides, applied by means of a treadle sprayer, were tested for the control of biting flies (predominantly *Siphona* (*Lyperosia*) *irritans* and *Stomoxys calcitrans*) on grazing beef cattle (weighing from 600 to slightly over 900 lb.) for 3 summers. Treated cattle gained more weight than controls in 1954 and 1955, but not in 1956, probably because of the cool temperatures, abundant rainfall and excellent forage crop in that year. The number of horn flies was reduced by over 95% and stable flies by about 70%. Pyrethrins plus piperonyl butoxide or MGK-264 gave satisfactory control, but the addition of butoxy polypropylene glycol to the formulation permitted a reduction in pyrethrins content without loss of efficiency. No influence of cattle breed on the numbers of biting flies was seen. It is concluded that a profitable return from biting fly control can be expected in most years.

LUMSDEN, W. H. R. (1958). **A trap for insects biting small vertebrates.**—*Nature, Lond.* **181,** 819-820. **2527**

A trap which samples at regular intervals the flying insects in the vicinity of a bait which is as nearly as possible freely exposed is figured and described.—D. POYNTER.

STONE, B. F. (1957). **Resistance to DDT in the cattle tick, *Boophilus microplus* (Canestrini).** —*Aust. J. agric. Res.* **8,** 424-431. **2528**

A strain of *B. microplus* from central Queensland had a resistance to DDT which was 22 times that of a susceptible strain. There was no significant resistance to "Diazinon", dieldrin or toxaphene.—M. D. MURRAY.

THOMPSON, M. E. & JOHNSTON, A. M. (1958). **Total sulphydryl content of embryos of arsenic-resistant and -sensitive strains of the blue tick, *Boophilus decoloratus*.** — *Nature, Lond.* **181,** 647-648. **2529**

The resistant strain contains slightly more than twice as much -SH radical as the sensitive strain.—D. POYNTER.

FAIN, A. (1956). Présence d'acariens de la famille *Speleognathidae* Womersley dans les fosses nasales de mammifères. Description de trois espèces nouvelles. **[Acari of the family Speleognathidae in the nasal chamber of mammals.]** — *Ann. Parasit. hum. comp.* **31,** 155-168. **2530**

Three new species of mites were found in the nasal chamber of mammals in Ruanda-Urundi. One of them (*Speleognathus bovis*) occurred in the maxillary and frontal sinuses of cattle; it was similar to *S. australis*.—R.M.

BAKER, E. W., EVANS, T. M., GOULD, D. J., HULL, W. B. & KEEGAN, H. L. (1956). **A manual of parasitic mites of medical or economic importance.** pp. 170. New York: National Pest Control Association, Inc. [Technical Publication.] **2531**

This manual summarizes current knowledge pertaining to the biology, taxonomy and control of the parasitic mites of medical and veterinary importance. It includes a key to the species described. In discussing control, reference is made to modern parasiticides.—R.M.

See also abstr. **2474-2475** (survival of encephalitis virus in mosquitoes); **2702** (report, Medical Research Council); **2705** (report, Netherlands); **2711** (book, diseases and parasites of poultry).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

TAYLOR, E. L. & PARFITT, J. W. (1957). **Mouse test for the infectivity of metacercariae with particular reference to metacercariae in snail faeces.**—*Trans. Amer. micr. Soc.* **76,** 327-328. [Authors' summary modified.] **2532**

Mice are the best animals for testing the infectivity of the metacercariae of *F. hepatica*. The intermediate host snails *Lymnaea truncatula*, frequently ingest metacercariae. Metacercariae found in the faeces of the snail are often infective.

KUNTZ, R. E. (1957). **Development of the cercariae of *Fasciola gigantica* Cobbold 1855, with emphasis on the excretory system.**— *Trans. Amer. micr. Soc.* **76,** 269-274. **2533**

K. studied the embryonic development of *F. gigantica* cercariae with special reference to the excretory system and stated that it resembles closely that described in *F. hepatica* and other Fasciolidae.—E.G.

TANDON, R. S. (1955). **On a new amphistome *Paramphistomum spinicephalus* n. sp. from the rumen of buffalo, *Bos bubalis*, from Lucknow.** — *Indian J. Helminth.* **7,** 35-40. [Abst. in *Helminth. Abstr.* **24,** 296-297 (1955). Signed: R.T.L.] **2534**

Paramphistomum spinicephalus n.sp. collected from the rumen of *Bos bubalis* at Lucknow resembles *P. orthocoelium* but has five or six rows of spines at the anterior end, the thick

intestinal caeca end very near to the acetabulum, the excretory pore is far behind the opening of Laurer's canal and there is an accessory transverse excretory duct slightly anterior to the excretory bladder. The vitellaria are elongated or irregularly shaped. The eggs are larger.

SMYTH, J. D. (1958). **Cultivation and development of larval cestode fragments *in vitro*.**—*Nature, Lond.* **181,** 1119-1122. **2535**

S. gives a brief review of the culture of cestodes and deals with his experiments on excised plerocercoid fragments of *Diphyllobothrium dendriticum*. In duck embryo extract fragments became segmented by the second day, developed genital anlage by the third day and by the sixth day had become differentiated into recognizable proglottides with mature spermatozoa. Virtually no cytoplasmic growth took place with the result that miniature proglottides were produced.—D. POYNTER.

INUKAI, T., YAMASHITA, J. & MORI, H. (1955). **Most probable route of introduction of *Echinococcus* into the island of Rebun.**—*J. Agric., Hokkaido Univ.* **50,** 134-139. [Abst. in *Helminth. Abstr.* **24,** 301 (1955) modified. Signed: R.T.L.] **2536**

Between 1924 and 1926, 12 pairs of red fox from the middle Kuriles were released in the island, and protected for their pelts. There is little doubt that these foxes introduced *Echinococcus*, as the symptoms of hydatid disease usually become evident about ten years after infection and human cases first began to appear in Rebun after 1937.

OSHIO, Y. (1956). **[Studies on the migration of the larvae of *Strongyloides ransomi* in the swine body after percutaneous infestation.]**—*Bull. Nat. Inst. agric. Sci., Japan* Ser. G. No. 12. pp. 181-186. [In Japanese. Summary in English.] **2537**

Migration of *Strongyloides ransomi* larvae in pigs was studied, using larvae tagged with P^{32}. After penetration of the skin they entered the lymphatic capillaries and blood vessels, the majority reaching the lungs and some also the liver. Those from the lungs eventually entered the small intestine *via* the trachea, oesophagus and stomach. The fourth day after skin penetration the parasites were present in the intestine and on the fifth day they were fully matured. In experimentally infected rabbits eggs were present in the faeces after about 11 days. In g. pigs larvae remained in the lungs.—E.G.

GORDON, H. McL. (1958). **The epidemiology of helminthosis in sheep in winter rainfall regions of Australia. 2. Western Australia.**—*Aust. vet. J.* **34,** 5-19. **2538**

G. details the general principles which underlie his epidemiological studies. In Western Australia the most important nematodes are *Haemonchus contortus, Trichostrongylus* spp. and *Chabertia ovina*. There is a regular seasonal pattern in the changes of worm burdens. The pattern tends to be similar for all species and is, in general, related to rainfall. Worms increase in late winter and early spring, then decline, only to increase again in late summer and early autumn. Administration of artificial 'challenge doses' of *Trichostrongylus* larvae to lambs and weaners showed that the animals were highly susceptible throughout the summer, although worm burdens were at their lowest.

The failure of *H. contortus* to increase in one spring when rainfall appeared adequate may have been related to the initial low egg count of 20 eggs per g. in this trial. Data are given which show that, under comparable climatic conditions, sheep with an initial mean egg count of 375 e.p.g. developed high egg counts within 74 days.—R. I. SOMMERVILLE.

DOUVRES, F. W. & TROMBA, F. G. (1958). **Cross transmission of nematodes of domestic animals. II. Infection of a calf with *Hyostrongylus rubidus*, the red stomach worm of swine.**—*Proc. helm. Soc. Wash.* **25,** 53-54. **2539**

A patent infection with *H. rubidus* was obtained in a calf by feeding infective larvae from a swine source. *Oesophagostomum longicaudum* could not be transmitted to calves.

—D. POYNTER.

SPEDDING, C. R. W., BROWN, T. H. & WILSON, I. A. N. (1958). **Observations on Nematodirus spp. infestation in sheep.**—*Vet. Rec.* **70,** 229-232. [Authors' summary modified.] **2540**

In studies of *N. filicollis* infestation it was confirmed that the ewe does not represent a significant source of infection for the lamb in the same year. The bulk of the infection was derived from eggs deposited on the pasture by lambs in May, June, and July of the previous year. Larvae were at maximum on the grass between January and May and it is suggested that heavy grazing by resistant stock during this period may assist in control. The essentials of managemental control lie in restricting the area of pasture contaminated in one year and prohibiting it for lambs in the next year.

GROVES, T. W. (1958). **A field experiment to test the safety of cyanacethydrazide for the treatment of cattle.**—*Vet. Rec.* **70,** 219-221. **2541**

100 lactating cows and 100 other cattle were treated with cyanacethydrazide, on each of 3 successive days. 50 animals of each group were dosed orally at 18 mg./kg. up to a maximum of 5·4 g. per head; the remainder were injected s/c at 15 mg./kg. up to a max. of 5 g. per head. A very slight effect was noted on the milk yield of the 100 lactating cows. 12 out of 36 store cattle in poor condition had temporary inappetence after the second treatment. No adverse effects were seen in 64 store animals in good condition. No differences in appetite, behaviour or milk yield were noted between oral and parenteral treatment.—D. POYNTER.

CAUTHEN, G. E. (1957). **Weight gain in phenothiazine-treated calves.**—*Amer. J. vet. Res.* **18,** 608-611. **2542**

A single dose of phenothiazine ranging from 60 to 96 g. was given to a total of 707 calves, in 24 separate experiments, at weaning or at various times before or after weaning. A further 578 calves served as undosed controls. Only in one out of the 24 experiments could a difference in live wt. gain be shown between treated and untreated calves and in this case the worm burden was sufficient to give rise to visible symptoms of disease. In calves with lighter worm burdens the phenothiazine treated animals did not gain weight more rapidly than the undosed controls.—J. F. MICHEL.

VILLELLA, J. B., GOULD, S. E. & GOMBERG, H. J. (1958). **Effect of cobalt-60 and X-ray on infectivity of *Ascaris* eggs.**—*J. Parasit.* **44,** 85-92. [Authors' summary.] **2543**

The effect of cobalt-60 was tested on development of unsegmented eggs of *Ascaris lumbricoides suum,* and of cobalt-60 and X-radiation on the ability of embryonated eggs to produce larval pulmonary infection in guinea pigs. After removal of their albuminoid outer coats, unsegmented *Ascaris* eggs were exposed to cobalt-60 and incubated for various periods at 30°C. Doses of 30,000, and 100,000 rep retarded development of embryos. Embryonated eggs seemed to be more sensitive than unsegmented eggs to radiation with cobalt-60. The observation of Graham (1937), that the guinea pig is much more susceptible than the white rat to pulmonary larval infection with embryonated *Ascaris* eggs, was confirmed.

A dose of 100,000 to 150,000 rep cobalt-60 applied to infective (embryonated) *Ascaris* eggs was necessary to prevent development of viable larvae in the lungs of the guinea pig. After a dose as high as 250,000 rep. some degree of pneumonitis was still produced following feeding of the eggs to guinea pigs. A dose of 100,000 roentgens X-ray (245 Kv.) was effective in preventing larvae from developing in the lungs of guinea pigs.

EDGAR, S. A., DAVIS, D. C. & FRAZIER, J. A. (1957). **The efficacy of some piperazine compounds in the elimination of helminths from experimentally- and naturally-infected poultry.**—*Poult. Sci.* **36,** 495-510. **2544**

The efficacy of piperazine compounds, phenothiazine, and nicotine in removing various species of helminths from naturally and experimentally infected fowls and turkeys was studied. 250-500 mg. of piperazine hexahydrate, given in capsule form or as 0·4% or 0·8% of the drinking water to chickens infected with *Ascaridia galli,* usually eliminated 95-100% of mature worms and 75-100% of immature worms. When the drug was given continuously to experimentally infected chicks as 0·2% of the drinking water for the first 50 days of age, 100% of mature and 79% of immature worms were expelled, but when it was given as 0·05% of the drinking water 95% of mature and no immature worms were expelled. Growth was not affected by the treatment. Piperazine appeared to be more effective at non-toxic doses than nicotine against *Ascaridia.* The effects of piperazine and phenothiazine on *Heterakis gallinae* and *Capillaria obsignata* were erratic, probably because irregular evacuation of the caecal pouch gave the paralysed worms time to recover. 400-500 mg. of piperazine hexahydrate by capsule or 200-1,150 mg. as 0·4% of the drinking water eliminated 92-100% of mature *A. dissimilis* from turkeys.—M.G.G.

WORLEY, D. E., HANSEN, M. F. & PERSAUD, B. R. B. (1957). **Action of piperazine compounds on lumen and tissue phase larvae of *Ascaridia galli* (Schrank), a roundworm of chickens.**—*Poult. Sci.* **36,** 865-870. **2545**

Chicks aged 14 days were infected with 75 or 100 embryonated ova of *A. galli.* From 4 to 17 days later treatment with one of 5 compounds, administered in capsules or in the food, commenced: diethylcarbamazine acid citrate; 1-carbethoxy-4-methylpiperazine hydrochloride ("Compound 180-C"); piperazine dihydrochloride; the betaine of 1-piperazine carbodithioic acid ("Parvex"); piperazine hexahydrate.

A significant reduction in the number of *A. galli* in the lumen of the intestine was obtained only with piperazine dihydrochloride (25 mg.) or hexahydrate (25 mg.) No compound influenced the tissue phase of the parasite.

—R.M.

ALICATA, J. E. (1958). **Observations on the dosage and method of administration of piperazine citrate to chickens for the control of *Ascaridia galli*.** — *Poult. Sci.* **37**, 89-96. [Author's summary modified.] **2546**

Piperazine citrate was at least 75% effective in removing 2 to 17-day-old *A. galli* larvae when administered to chickens at the rate of 1,500 to 2,000 mg./kg. body wt. In lower dosage it was less efficient. Adult parasites were completely eliminated when the drug was administered in gelatin capsules or in a small amount of wet mash at the rate of 200 to 300 mg./kg. body wt. When it was given as 0·2–0·3% of the food or 4 g. per gal. of drinking water, about 80% of adult parasites were eliminated. As 0·05% of the food it was only partially effective in preventing ascarid infection. At 0·1% it was comparatively effective, but this concentration is too high for practical use.

SOULSBY, E. J. L. (1958). **Immunity to helminths.**—*Vet. Rev. Annot.* **4**, 1-16. [Author's summary.] **2547**

Immunity to helminths may be manifested by a complete refractoriness to infection, the elimination of an existing infection, as exemplified by the "self cure" mechanism, or the depression of growth, development and reproduction.

In general, satisfactory protective immunity can be induced only by the presence of the living worms within the host. The antigenic stimulus for the production of protective immunity appears to be provided by metabolic materials, associated with the living worm. These metabolic materials by themselves, will induce immunity and it is likely that antibodies to them function in an anti-enzymic manner. Protective antibodies are, in general, non-absorbable by preparations of tissues of parasites but may be neutralized by metabolic products of helminths.

Evidence is accumulating that certain specific stages of a parasitic infection may be of outstanding importance in stimulating immunity and in being affected by immune processes.

Retardation of the growth of larval stages may produce "dormancy" of larvae in the intestinal mucosa, these dormant larvae being able to resume development on the elimination of the concomitant adult worm population.

In addition to mechanisms resulting in protection of the host other phenomena occur. Some may explain the natural resistance of animals to certain helminths, some may be beneficial to the parasite whilst others such as the stimulation of blood group antibodies remain unexplained.

See also absts. **2484** (swine lungworm as vector of swine fever); **2608** (effect of Ascaridia galli infestation on chicks with infectious bronchitis); **2702** (report, Medical Research Council); **2705** (report, Netherlands); **2711** (book, diseases and parasites of poultry).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

KULKARNI, H. V. (1958). **Carcinoma of the horn and the eye in bovines.**—*Indian vet. J.* **35**, 76-82. **2548**

Cancer of the horn core proved to be squamous-cell carcinoma in most cases, though sometimes the growths in early stages were myxomatous in character. Pulmonary metastasis was found in one case. Cancer was found to be much more common in draught bullocks having massive horns than in cows, and mechanical injury to the horn was suspected as the probable cause.—R. N. MOHAN.

LEE CHIN HUA. (1957). **Haemangioendotheliomata in a herd of pure-bred Middle White swine.**—*J. Malay. vet. med. Ass.* **1**, 164-167. **2549**

Two male Middle White weaner pigs were imported from the United Kingdom into Malaya in 1952. They developed, at about one year of age, "blebs" on the skin of the scrotum, which continued to grow, and formed reddish-blue growths, from the size of a split-pea to that of a grape. Two male progeny were affected, and sows, the progeny of the two boars, also had multiple lesions, chiefly of the region of the vulva, but also involving the mammary gland region. Histological examination showed dermal capillary haemangiomas. Various drugs were tried without effect (including "Anthiomaline", "Acetylarsan", chloramphenicol), and severe haemorrhage followed surgical extirpation or ligation. Two of the animals were destroyed, and autopsy showed lesions in the lungs, somewhat resembling the dermal lesions, and many tiny growths studding the spleen.

Injection of a saline emulsion of scrotal lesions into the scrotal skin of another pig produced no result in 2 months. However, although a genetic basis for the lesions is possible, it is suggested that further attempts at transmission need to be made.—E. COTCHIN.

SCHLUMBERGER, H. G. (1957). **Tumors characteristic for certain animal species.** — *Cancer Res.* **17,** 823-832. **2550**

The literature on neoplasms of fishes, amphibians, reptiles, birds and mammals is briefly reviewed from the point of view of seeing which tumours occur with markedly greater frequency in any one particular species than in others, and may thus be considered to be "species characteristic". A table summarizes the information, which is however incomplete as regards domesticated mammals. The whole article is worth consulting by those interested. The author points out that the existence of "species characteristic" tumours implies some constitutional susceptibility, which may not necessarily be to neoplastic growth as such, but rather to a particular environmental or other factor: such factors, perhaps, as sunlight in the case of "eye cancer" of cattle, or chemical pollution of streams in the case of lip tumours of catfish. The co-operation of biologists and others is sought in recording tumours which may prove to be characteristic of certain species. "The information so obtained will contribute to our knowledge of comparative oncology, and may provide data on the interaction of genetic and environmental factors in the aetiology of neoplasia."—E. COTCHIN.

WAKELEY, C. & GRAVES, F. T. (1958). **The papilloma and its relation to cancer.**—*Lancet* February 15th, 329-333. [Authors' summary modified.] **2551**

The papilloma at any site is a potential source of cancer, although it is least so in the skin. The multiplicity and coexistence of papilloma and carcinoma is probably due to multifocal neoplastic change in an area of tissue. Different phases of this change, varying from papilloma to malignancy, both without and with invasion, may be present either simultaneuosly or at different times. The tumour may be caused by direct chemical stimulation, or by a virus attack, which itself is probably a disturber of biochemistry, or by a simple mutation.

JOHNSON, I. S. & BAKER, L. A. (1958). **The utility of the Rous sarcoma virus for detection of antiviral activity.**—*Antibiot. & Chemother.* **8,** 113-121. [Summary in Spanish p. 164.] **2552**

Inhibition of Rous sarcoma in the wing-web of fowls was found to be an accurate test for antiviral activity. The prophylactic action of an antibiotic broth referred to as "MS-8450" was demonstrated.—R.M.

HARRIS, C., BURKE, W. T., GRUENSTEIN, M. & SHAY, H. (1958). **The pathogenesis of transferred chloroleukemia in the albino rat.** — *Blood* **13,** 162-176. [Summary in Interlingua. Authors' summary modified.] **2553**

In this type of leucaemia, after i/p inoculation the leucaemic cells colonized first the retroperitoneal fat, then almost simultaneously the liver, spleen, lungs, and bone marrow. Only after the leucocyte pool was saturated with leucaemic cells did the peripheral blood show an increase in both abnormal and normal components.

DOMAŃSKI, E. & DOBROWOLSKA, D. (1957). Badania nad białaczką kur. **[The avian leucosis complex.]**—*Roczn. Nauk rol.* Ser. E. **68,** 1-23. [In Polish. Summaries in English and Russian.] **2554**

The authors investigated the effect of feeding on the incidence and course of erythroleucaemia and neurolymphomatosis. Experimental infection with erythroleucaemia was successful in 50% of birds fed a diet deficient in vitamins B, B_{12} and C, but only in 20% of birds fed a balanced diet. Administration of fresh bovine liver *per os* and vitamin B_{12} parenterally prolonged the birds' life, though it failed to restore full regenerative properties of the haemopoietic system. The same treatment had no effect on the course of neurolymphomatosis. After 2½ years' observations involving 710 fowls the authors found no evidence that either erythroleucaemia or neurolymphomatosis can be transmitted through the eggs. The incidence of erythroleucaemia on the infected farm was more or less constant throughout the year while outbreaks of neurolymphomatosis were sporadic and lasted 2–4 weeks. The authors are of the opinion that the two conditions are different disease entities. In their experience erythroleucaemia spread mainly by direct contact while neurolymphomatosis spread also by indirect means.

—M. GITTER.

NUTRITIONAL AND METABOLIC DISORDERS

ARMSTRONG, D. G., BLAXTER, K. L. & GRAHAM, N. McC. (1957). **Utilisation of the end products of ruminant digestion.**—*Proc. Brit. Soc. Anim. Prod.* 1957. pp. 3-15. **2555**

About 400 experiments were conducted on fistulated sheep, kept in respiration chambers, to determine the 24-hour exchange of energy when steam-volatile fatty acids or glucose were introduced continuously into the rumen. When the fatty acids were given individually to fast-

ing sheep in amounts insufficient for maintenance they were all utilized less efficiently than glucose. Acetic acid resulted in a much greater heat increment than propionic and n-butyric acid and caused severe acidosis. When mixtures of these three fatty acids were administered to fasting sheep the composition of the mixture did not affect the efficiency of utilization which was much greater than that of acetic acid alone. When the fatty acids were given to sheep receiving a maintenance ration they were utilized much less efficiently than previously. Acetic acid produced the greatest heat increment and n-butyric acid the least. When mixtures of the acids were given, the mixture containing the most acetic acid was the least efficiently utilized.—E. J. CASTLE.

COLES, R. (1957). **Further studies on fishmeal and the hatching rates of hen's eggs.** — *J. agric. Sci.* **49**, 95-99. **2556**

Fish meal, obtained from 4 different sources, was fed, as 10% of the diet, to 4 groups each of 21 or 22 pullets. The hatching rate ranged from 85·2% to 60·8%, and was inversely related to the depth of coloration of the meal. It is suggested that overheating of fish meal during manufacture may cause degradation of proteins and give rise to toxic substances. Bacterial examination of the meals revealed aerobic sporing bacilli in all four, but in one they were of a type capable of coagulating yolk; the group receiving this meal had the highest mortality from yolk-sac infection and the highest mortality in chicks up to 6 weeks of age.
—M.G.G.

EVANS, R. J., BANDEMER, S. L., DAVIDSON, J. A. & SCHAIBLE, P. J. (1957). **Studies on the occurrence of pink whites and salmon colored yolks in stored eggs from hens fed crude cottonseed oil or cottonseed meal.**—*Poult. Sci.* **36**, 798-807. **2557**

A review of 12 years' work at Michigan Agricultural Experiment Station.—R.M.

LEMAIRE, R., DUPONT, M. & SABATHIER, J. (1957). Signification des variations pondérales constatées au cours de la réhydratation chez le cheval. **[Changes in the body weight of horses during rehydration.]** — *C. R. Soc. Biol., Paris* **151**, 1176-1180. **2558**

After the water loss is replenished there remains a deficiency of protein and lipid material in the blood.—D. POYNTER.

GILLESPIE, R. J. G. & LUCAS, C. C. (1958). **Accurate measurement of liquid intake of small animals.**—*Canad. J. Biochem. Physiol.* **36**, 29-36. **2559**

In studies of water balance or in investigations involving the intake of various substances in drinking fluid, accurate measurement of the volume of liquid consumed by rats and mice is frequently difficult to record owing to spilling and evaporation. The uncertain performance of the conventional watering devices make them unreliable for this purpose.

The authors described a compact unit known as the "Gillespie Drinking Fountain" which has been under study for more than three years. It is claimed to be more reliable for the purposes intended since it minimizes spilling and by collecting any spilt liquid reduces its evaporation. Evaporation of liquid from the reservoir is small and relatively constant.
—R. V. L. WALKER.

JOHNS, A. T. (1958). **Recent developments in bloat research.**—*Vet. Rev. Annot.* **4**, 17-31. [Author's summary.] **2560**

Foaming of the rumen contents is becoming more widely recognized as a major factor in the aetiology of legume and "feed lot" bloat. Two possible modes of action are (a) a direct inhibition of the eructation mechanism by foam and (b) the retention of the fermentation gases within the foam thereby preventing them being eliminated by belching. The foam formed in the rumen is of the stable, high viscosity type which has a pH optimum in the region of 6 for maximum foam strength.

Differences between animals in their susceptibility to the condition may be due to (a) a difference in rate of saliva flow in response to rumen pressure and (b) an inherited difference in saliva composition. No difference in chemical composition has been found between bloating and non bloat-producing legumes.

Two methods of controlling bloat in the field are (a) antifoaming agents (oil or tallow) as a pasture spray, (b) oral administration of penicillin. The former is the most reliable while the latter has its uses where a small number of animals is involved.

SIMS, F. H. & CROOKSHANK, H. R. (1957). **Wheat pasture poisoning.**—*Sthwest. Vet.* **10**, 277-281. **2561**

In cases of wheat pasture poisoning observed by the authors, 7% were in cows in the last 3 months of pregnancy, 79% were in cows which had calves less than 60 days old, and 14% were in cows with calves over 60 days old. The condition was not prevented by salt, cotton-seed meal, mineral mixtures, silage, and

various dry feeds. No significant differences in chemical composition were found in wheat plants taken from pastures where the condition had been observed and where it had not been observed, nor in wheat plants from plots treated with nitrogen or potassium, or both, or left untreated. Younger plants, however, had a higher content of crude protein, phosphorus and potassium. [See also *V.B.* **26**, 1344.]—M.G.G.

GIARDINELLO, F. E., MCLIMANS, W. F. & RAKE, G. W. (1958). **The apparent toxicity of metallic metals of construction and antifoam agents for mammalian cell lines.** — *Appl. Microbiol.* **6**, 30-35. **2562**

Although copper, copper alloys and aluminium were toxic to cultured tissues, stainless steel was non-toxic. Three strains of cells were grown in 5-gal. stainless steel fermenting vessels. Four of 25 anti-foam agents were non-toxic to tissue cultures, and were used to prevent foaming in the vessels.—R.M.

BELL, F. R. (1958). **Pressure developed within the reticular compartment of the ruminant stomach.**—*Nature, Lond.* **181**, 494. **2563**

Pressure changes in the antrum of the reticulum were recorded, in eight goats, by means of an open ended small-bore polythene tube passed down the oesophagus intranasally and connected to an electromanometer. Contractions of the reticulum occurred every 43–52 sec., the pressure rising from near atmospheric level to 50 cm. water or more in 2–3 sec. and falling again in 1–2 sec.—E. J. CASTLE.

GRESHAM, G. A., CRUICKSHANK, J. G. & VALENTINE, J. C. (1958). **Pigmentation of intestinal muscle in steatorrhoea.**—*Nature, Lond.* **181**, 538-539. **2564**

Sections of intestine from 50 human post-mortem cases suffering from various intestinal disorders were examined histologically. Details of preparation and staining are given. In the one case of Whipple's disease and the five cases of steatorrhoea a pigment was found in the smooth muscle of the small intestine and in that of the stomach and colon. Histochemical tests indicated that the pigment was a lipoprotein.
—E. J. CASTLE.

BARBER, R. S., BRAUDE, R., MITCHELL, K. G., ROOK, J. A. F. & ROWELL, J. G. (1957). **Further studies on antibiotic and copper supplements for fattening pigs.**—*Brit. J. Nutr.* **11**, 70-79. **2565**

Copper sulphate (0·1% of the diet), oxytetracycline (10 g./ton), and chlortetracycline (20 g./ton) produced similar increases in the growth rate and food consumption of pigs. Chlortetracycline and $CuSO_4$ also improved the efficiency of food utilization. The Cu content of the liver in pigs fed $CuSO_4$ was, on the average, 109·4 mg./kg. wet material, eight times more than in controls. Pigs fed $CuSO_4$ as 0·5% or 1% of the diet rapidly lost their appetite, but recovered as soon as the supplement was reduced to 0·1% or omitted.—M.G.G.

MCGINNIS, J. & JENSEN, L. S. (1958). **A difference in growth response of chicks and turkeys to different antibiotics.**—*Fed. Proc.* **17**, 484. [Authors' abst. modified.] **2566**

Failure to obtain a growth response was attributed to a decreased need for antibiotics through modification of the microbial environment resulting from continued use of antibiotics. During the past year, 4 experiments were conducted with turkeys and chicks in which 2 antibiotics not previously used in the flocks were compared with procaine penicillin for growth promotion. In all experiments penicillin failed to give a significant growth response, whereas oleandomycin and erythromycin gave statistically significant responses in all experiments. Other antibiotics previously used were inactive for promoting growth. These results would suggest that the micro-organisms against which antibiotics act to stimulate growth of chicks or turkeys have developed resistance to the antibiotics that have been used frequently as diet supplements.

HARRY, E. G. (1958). **Some observations on the serum response of chicks to oral dosage with aureomycin.**—*J. Sci. Fd Agric.* **9**, 82-88. [Author's summary modified.] **2567**

When chicks were fed a ration containing a high level of chlortetracycline, bacteriostatic concentrations of the antibiotic were found in the serum within a few hours. Minimum serum response for 4 to 5-week-old chicks was obtained with 100 p.p.m. of the antibiotic in the feed. Great variations occurred in the serum response of chicks to the antibiotic and some of the factors involved were discussed.

GLICK, B. (1958). **The effect of procaine penicillin on the white blood cells of chickens.**—*Poult. Sci.* **37**, 78-81. [Author's summary modified.] **2568**

Penicillin fed to chickens at a rate of 50 g. per 1,000 lb. of food increased body weight, total white cell counts and absolute counts of lymphocytes. The correlation coefficients between body weight and total white cell and differential counts were inconsistent and indicated little or

no relationship. It is suggested that penicillin may act directly on the white cell centres or it may activate a "leucocytic factor".

BARNETT, A. J. G. & REID, R. L. (1957). **Studies on the production of volatile fatty acids from grass by rumen liquor in an artificial rumen. II. The volatile fatty acid production from dried grass. III. A note on the volatile fatty acid production from crude fibre and grass cellulose.**—*J. agric. Sci.* **49,** 171-179 & 180-183. **2569**

II. A detailed account of the experiments which had been reported briefly in the *Biochem. J.* [see *V.B.* **27,** 3362].

III. The proportions of different volatile fatty acids obtained, by the action of rumen liquor, from grass crude fibre and from grass cellulose resembled those obtained from cellulose powder, propionic acid being produced in the largest quantities.—M.G.G.

GERSON, T., SHORLAND, F. B. & BARNICOAT, C. R. (1958). **Seasonal changes in the fatty acid composition of ewe-milk fat.**—*Biochem. J.* **68,** 644-646. [Authors' summary.] **2570**

The fatty acid composition of Romney ewe-milk fat taken at the peak, decline and end of lactation has been determined. It is shown that the reduction in the content of C_{18} unsaturated acids at the end of November (late spring) is similar to that of cow-milk fats. This period represents the end of lactation for the early-lambing ewe, but only the middle of lactation for the cow. It is suggested that the change in fatty acid composition is associated with the increased food intake in November, and is not greatly influenced by the stage of lactation.

LICHTON, I. J. (1958). **Lack of normal rise in blood pressure with age in chickens deprived of choline early in life.** — *Fed. Proc.* **17,** 96. **2571**

The arterial blood pressure of male chicks normally increases with increasing age. The increase does not occur in female chicks, neither did it occur in male chicks fed a choline-deficient diet. In addition, the choline deficient birds had smaller testicles and smaller comb than birds fed normally.—R.M.

MCDONALD, M. W. (1958). **Methionine supplements in chicken diets. 3. The biochemical difference in sulphur-amino acid metabolism between White Leghorns and Australorps.**—*Aust. J. agric. Res.* **9,** 161-169. [Author's summary modified.] **2572**

The ability of White Leghorn and Australorp chickens to use supplements of methionine or cystine for growth was studied. While chickens of both breeds responded to a cystine supplement, White Leghorns showed an increase in growth rate when methionine was added to the basal diet but Australorps showed a growth depression.

The effect of intraperitoneal injection of DL-methionine on the liver cysteine content of chickens of both breeds was also studied. Injections of 10 or 20 mg. DL-methionine produced significant ($P<0{\cdot}05$) and highly significant ($P<0{\cdot}01$) rises in the liver cysteine contents of White Leghorn chickens, but produced only small, non-significant rises in the liver cysteine contents of Australorp chickens.

Providing methionine by either intraperitoneal inj. or crop drenching did not alter the breed difference in response of liver cysteine content. This indicates no difference between breeds in ability to absorb methionine from the alimentary canal.

When all data on the effect of an inj. of 20 mg. DL-methionine were examined, there was a significant breed × methionine interaction.

These results were interpreted as due to a blockage in the synthesis of cysteine from methionine in Australorps.

Attention was drawn to the linkage of the gene (or genes) limiting this process in Australorps with a gene producing slow feathering and thus possibly conserving cysteine. Possible advantages of this linkage were discussed.

LEBLOND, C. P., EVERETT, N. B. & SIMMONS, B. (1957). **Sites of protein synthesis as shown by radioautography after administration of S^{35}-labelled methionine.** — *Amer. J. Anat.* **101,** 225-271. **2573**

The radioactivity of organs and tissues of rats after injection of methionine-S^{35} has been used as an index of local protein synthesis. Growing and non-growing (thyroidectomized) adult male rats were killed at 4, 24, and 36 hours after administration of methionine.

Detectable radioautographs were produced by the cytoplasm of all cells studied, although some cells are much more radioactive than others. Prominent reactions indicative of rapid protein synthesis were classified into three main types: (1) those associated with the formation of new cells, as seen in haemopoietic tissues, gastro-intestinal and other epithelia, testis, etc.; (2) those due to various types of secretory materials, such as exocrine secretions (with most active protein formation in the serous cells of the pancreas, trachea, and demilune of sublingual gland), endocrine secretions (thyroid colloid), newly formed structural components

(dentinal matrix) and circulating substances (plasma protein); (3) those in which neither renewal nor secretory processes are known to occur, such as kidney cortex and nerve cells; reactions of this type are attributed to turnover of intracellular protein material.—R.M.

DRAPER, H. H. (1958). **The absorption of radiolysine by the chick as affected by penicillin administration.** — *J. Nutr.* **64**, 33-42. [Author's summary modified.] **2574**

The effect of feeding penicillin on the disappearance of radioactivity from the digestive tract was studied in chicks given an oral dose of C^{14}-L-lysine. In chicks fed penicillin the small intestine and caeca weighed less than in controls, and less radioactivity was recovered from the digestive tract $2\frac{1}{2}$ hours or one hour after the administration of the labelled amino-acid. The results imply that absorption was more efficient from the lighter intestinal tract of the birds treated with penicillin than from the heavier tract of the controls.

I. DESHPANDE, P. D., HARPER, A. E. & ELVEHJEM, C. A. (1958). **Amino acid imbalance on low fibrin diets.**—*J. biol. Chem.* **230**, 327-333. **2575**

II. DESHPANDE, P. D., HARPER, A. E. & ELVEHJEM, C. A. (1958). **Amino acid imbalance and nitrogen retention.** — *Ibid.* 335-342. **2576**

I. Amino-acid imbalances were created in rats by supplementing a low protein diet containing 6% fibrin with various combinations of amino-acids.

When methionine and phenylalanine, the amino-acids calculated to be most limiting for growth, were added either alone or together, a complex imbalance involving leucine, isoleucine, valine, and histidine was created.

Supplementation of the fibrin diet with the six amino-acids stimulated growth but at the same time caused fat to accumulate in the liver. This accumulation did not occur if lysine and threonine were also present. A combination of lysine and threonine was more effective than either acid alone.

When sucrose was replaced by dextrin, although growth was substantially improved, the same effects of the various amino-acid supplements on growth and liver fat deposition were observed.

II. When an amino-acid imbalance was created, the rat's appetite was less, as was also its capacity to retain ingested nitrogen. These two changes resulted in severe growth depression.—R.M.

HARRISON, H. C. & HARRISON, H. E. (1958). **Interrelation of calcium and citrate metabolism.**—*Fed. Proc.* **17**, 66. [Authors' abst. modified.] **2577**

Analyses of blood samples drawn simultaneously from the portal vein and femoral artery of dogs reveal consistently higher concentrations of citrate in the plasma of portal blood than in arterial. Following administration of calcium lactate solution intraduodenally there is a rapid and marked increase in citrate concentrations of portal and arterial plasma. This effect is not produced by equivalent amounts of ammonium, magnesium or strontium lactate. Intraduodenal injection of calcium lactate elevates plasma citrate in both vitamin D deficient and vitamin D fed rats although the initial plasma citrate conc. is higher in the vitamin D fed animals. The increment of plasma citrate following a Ca load is as great in the vitamin D deficient rat as in the vitamin D treated rat, indicating that vitamin does not reinforce the Ca effect. Cortisol reduces plasma citrate conc., suppresses the rise of citrate following Ca loading and also reduces efficiency of intestinal absorption of dietary Ca. The increase of citrate conc. in portal plasma following an intra-intestinal Ca load indicates an effect of Ca upon accumulation of citrate in intestinal cells and its release into extracellular fluids which may be of significance in the intestinal absorption of Ca. The action of vitamin D upon citrate metabolism might be due to increased uptake of Ca by cells. The blocking by cortisol of the Ca effect upon citrate concentrations is associated with inhibition of Ca absorption.

VAN REEN, R., LYON, W. & LOSEE, F. L. (1958). **Experimental formation and prevention of calcium citrate urinary calculi in the rat.** — *Fed. Proc.* **17**, 496. [Authors' abst. modified.] **2578**

Urinary calculi occurred in rats on some diets but not in rats on other diets. When the level of salt mixture was 4%, calculi were observed in rats fed diets containing 15 and 20% vitamin-free casein but calculi did not occur at 30 or 40% casein. When the mineral supplement was lowered to 2%, urolithiasis occurred in a large proportion of the animals fed 15% casein but in only a few of the rats receiving 20% casein. These findings strongly indicate the role of the casein/mineral ratio in the prevention of urolithiasis in these animals. In the above experiments the higher casein was added at the expense of sucrose. In further studies using 2% mineral mixture, the casein was altered from 15, 17, 19, to 20% but the sucrose content was

not varied. Numerous calculi occurred at the two lower levels of casein and relatively few at the higher levels. This is taken as further evidence of the importance of the casein : mineral ratio.

LEWIS, P. K., JR., HOEKSTRA, W. G. & GRUMMER, R. H. (1957). **Restricted calcium feeding versus zinc supplementation for the control of parakeratosis in swine.**—*J. Anim. Sci.* **16,** 578-588. **2579**

In a study of the prevention of parakeratosis in pigs, the authors fed a diet already containing 28 p.p.m. of Zn, to which they added varying amounts of Ca and Zn. In a group of 6 pigs whose diet contained 0·5% Ca one developed skin lesions but its growth was normal. All of 4 pigs that received Ca as 0·8% of the diet developed parakeratosis after 12 weeks and one died. Parakeratosis was severe in 6 pigs fed Ca as 1·2% of the diet, and 2 died. No lesions developed in pigs which were fed the 0·8% Ca ration supplemented with 100 or 1,000 p.p.m. of Zn and their weight gains were similar to those of the pigs fed the 0·5% Ca diet. The Zn content of the pancreas was 115 μg./g. in pigs on the 0·5% Ca ration, 95 in those on the 0·8% ration, but 125 in those on the 1·2% ration. The Zn content of liver, kidney, hair and bone decreased with rising Ca consumption. The ration containing 1·028 p.p.m. of Zn did not increase the Zn content of the skin, but marked increases were found in the liver, hair, and especially the pancreas. It did not give rise to symptoms of toxicity. It is concluded that, because of the risk of Ca deficiency, Zn supplementation is preferable to restricted Ca intake in preventing parakeratosis. —M.G.G.

PATRICK, H. (1958). **Zinc deficiency in chicks.** —*Fed. Proc.* **17,** 487. [Author's abst. modified.] **2580**

Zinc deficiency in chicks is characterized by poor growth, dermatitis, short, bowed bones, poor feather growth and abnormal feather pigmentation. Two soya bean protein-cerelose rations which differed by source of phosphorus were used. One contained dicalcium phosphate and the other tricalcium phosphate. Tricalcium phosphate resulted in a greater severity of zinc deficiency than dicalcium phosphate. Addition of calcium carbonate aggravated the zinc deficiency more in the chicks receiving the tricalcium phosphate than in those receiving dicalcium phosphate. Tri-magnesium phosphate also aggravated the zinc deficiency.

ENDER, F., DISHINGTON, I. W. & HELGEBOSTAD, A. (1957). **The magnesium problem in relation to the tetany paresis syndrome in dairy cows.** — *Nord. VetMed.* **9,** 881-917. [In English. Summaries in German and Norwegian.] **2581**

The authors discussed the literature on grass tetany and reported experiments on the influence of fertilizers on the mineral composition of grass and on the incidence of grass tetany in cattle. Top-dressing pastures with ammonium sulphate plus potassium sulphate appeared to cause severer hypomagnesaemia in cattle than calcium ammonium nitrate plus potassium chloride.—R.M.

GRACEY, J. F. & TODD, J. R. (1958). **Enzootic ataxia ("swayback") in lambs in Northern Ireland.**—*Vet. Rec.* **70,** 238-239. [Authors' summary modified.] **2582**

An outbreak of a mild type of enzootic ataxia in Northern Ireland is described. Histopathological changes were confined to the spinal cord.

BLAXTER, K. L., HUTCHESON, M. K., SHARMAN, G. A. M. & MACDONALD, A. M. (1957). **Anaemia in calves.**—*Proc. Nutr. Soc.* **16,** No. 2. p. i. of proceedings. **2583**

Iron-deficiency anaemia was produced by feeding whole cow's milk supplemented with Mg, Cu and vitamin E for 18–24 weeks to calves housed in wooden pens. Daily administration of 25 mg. iron succinate alleviated but did not cure the anaemia. It was estimated that a calf required 100 mg. Fe daily.—R.M.

BEUTLER, E. (1958). **Iron content of haemoglobin in iron deficiency.**—*Nature, Lond.* **181,** 837-838. **2584**

In iron deficiency a defect in the haem synthesis appears to limit in some way the synthesis of globin.—D. POYNTER.

MOSIER, H. D. & RICHTER, C. P. (1958). **Response of the glomerulosa layer of the adrenal gland of wild and domesticated Norway rats to low and high salt diets.** — *Endocrinology* **62,** 268-277. [Authors' abst. modified.] **2585**

Wild and domesticated Norway rats were fed diets containing sodium chloride in eleven concentrations between 0·5% and 70%. On concentrations up to and including 25% rats of both strains remained in good health over the experimental period of 70–90 days, and water intake increased in direct proportion to the amount of salt obtained from the diet. On salt concentrations of 35% and above, all the rats

died because of inability to ingest adequate amounts of water and food. On a low salt diet, the glomerulosa of the adrenals became hyperplastic in domesticated rats, but did not change in wild rats. On a high salt diet the glomerulosa of both strains showed atrophic changes. In wild rats it underwent only a partial loss of sudanophilic lipid or none at all, despite a complete lipid loss in domesticated rats. The zona fasciculata and reticularis in both strains increased its lipid and Schiff-reacting aldehyde.

EVERSON, G. J. & HURLEY, L. S. (1958). **Importance of manganese for normal embryonic development of guinea pigs.**—*Fed. Proc.* **17**, 476. [Authors' abst. modified.] **2586**

A pelleted purified diet has been devised which when fed to young female g.pigs during growth and reproduction supports satisfactory development of the young. Omission of Mn from the salt mixture resulted in defective offspring which exhibited ataxia. Mortality was high. Females receiving the supplemented diet were able to produce two healthy litters. Two generations of g.pigs have been continued on the complete purified diet.

REID, B. L., DAVIES, R. E. & COUCH, J. R. (1958). **Relationship of sulfate, copper and manganese to molybdenum in diet of the chick.**—*Fed. Proc.* **17**, 294. [Authors' abst. modified.] **2587**

The effect of dietary ions on the toxicity of molybdenum and on growth at subtoxic levels of the element was studied. The toxic level of Mo in the purified diet (500 p.p.m.) depressed growth by 10% and there were no clinical or haematological symptoms. A progressive decrease in growth was observed as Mo in the diet was increased to 4000 p.p.m. With 6000 p.p.m., growth was only 20% of that of the controls, and a reduction in r.b.c., haemoglobin and haematocrit was apparent. Sodium sulphate in a ratio of 2:1 with Mo resulted in a partial restoration of growth, and partial alleviation of the anaemia; methionine was ineffective. Sulphate had little effect on the Mo content of tissues. Copper (40 p.p.m.) failed to overcome the growth depressing effect of 4000 p.p.m. molybdenum.—R.M.

SUPPLEE, W. C., COMBS, G. F. & BLAMBERG, D. L. (1958). **Zinc and potassium effects on bone formation, feathering and growth of poults.**—*Poult. Sci.* **37**, 63-67. [Authors' summary modified.] **2588**

Zinc was required by poults for rapid growth, normal bone formation and feather development. The requirement for potassium appeared to be higher than 0·36% of the diet.

ECONOMOU-MAVROU, C. & MCCANCE, R. A. (1958). **Calcium, magnesium and phosphorus in foetal tissues.**—*Biochem. J.* **68**, 573-580. [Authors' summary.] **2589**

Calcium, magnesium and phosphorus have been determined in the serum, skeletal muscle, membranes and fluids of the rabbit at 21 days' gestation, of the pig at 19 and 46 days, and of the human foetus at several stages of gestation. In the foetal muscles the concentrations of calcium were higher, and of magnesium and phosphorus lower, than in those of adults. The calcium was probably intracellular. Foetal serum may contain more calcium, magnesium and inorganic phosphate per unit volume than the maternal serum. The amniotic membranes and the allantoic fluids may contain high concentrations of calcium. When there was much calcium in the allantoic fluid of the pig it was accompanied and probably maintained in solution by high concentrations of citrates.

MAYNARD, L. A., BOGGS, D., FISK, G. & SEGUIN, D. (1958). **Dietary mineral interrelations as a cause of soft tissue calcification in guinea pigs.**—*J. Nutr.* **64**, 85-97. [Authors' summary modified.] **2590**

In contrast to the satisfactory results obtained in g.pigs with the purified diet described by Reid & Briggs (1953), lowering the Mg content of this diet by about 70% resulted in poor growth, enlarged and damaged kidneys, low Mg and high P content of the serum, a very large increase in the Ca content of the kidney and a smaller increase in the liver. When the Ca and P content of the diet was lowered also, these deleterious effects did not occur. Neither lowering both Mg and P, thus keeping Ca relatively high, nor lowering Mg and Ca but keeping P high, produced as marked effects as when Mg alone was decreased. The high P diet did result, however, in marked kidney damage in some animals.

I. MCCANCE, R. A. & WIDDOWSON, E. M. (1958). **The response of the new-born puppy to water, salt and food.**—*J. Physiol.* **141**, 81-87. **2591**

II. MCCANCE, R. A. & WIDDOWSON, E. M. (1958). **The response of the new-born piglet to an excess of potassium.**—*Ibid.* 88-96. [Authors' summaries modified.] **2592**

I. Unfed new-born puppies were given water, 0·7% saline, dog's or sow's milk, salted

milk or nothing at all for the first 24 hours of their lives. The water was incompletely excreted, but that which was excreted was accompanied by loss of salt originally in the body. Administered salt was tolerably well excreted and did not lead to hypertonic expansion of the extracellular fluids, as it has been shown to do in piglets and human infants. Growth was a most important element in the maintenance of homoeostasis.

II. Piglets were given the following by stomach tube two hourly for the first 40 hours of their lives (1) water, (2) water and KCl, (3) sow's milk, (4) sow's milk and KCl, and (5) nothing. Most of the KCl was excreted, but the administration of KCl in water led to progressive retention of K, paralysis and raised blood sugar. The animals getting KCl in milk retained a mild excess of K but growth, which was normal, completely protected them from toxic effects. The serum, urine and tissues were collected and analysed and the results reported in tabular form.

CHRISTENSEN, N. O., ENGELUND, A., MUNCH, T. & TERP, P. (1957). **Studies on the absorption of vitamin A. I. Object of investigations and review of literature.**—*Nord. VetMed.* **9,** 455-463. [In English. Summaries in German and Danish.] **2593**

The literature on the absorption of vitamin A after oral and after parenteral administration is reviewed, and the parental toxicity of Tween compounds (used as vehicles for vitamin A) in lab. animals is surveyed. The object of the investigations, to be described in subsequent articles, is to compare the absorption of vitamin A after oral and afer i/m administration, and to seek evidence of inflammation at the sites of injection by histological examination of tissue sections.—M.G.G.

KENT, S. P., VAWTER, G. F., DOWBEN, R. M. & BENSON, R. E. (1958). **Hypervitaminosis D in monkeys; a clinical and pathologic study.**—*Amer. J. Path.* **34,** 37-59. [Authors' summary modified.] **2594**

A colony of 558 monkeys (*Macaca mulatta*) was inadvertently given a diet high in vitamin D for 3 months. The clinical and pathological findings noted during this period and for a year thereafter are described, and compared with those reported in other species. There was loss of weight, anaemia, elevation of blood urea nitrogen and serum calcium, and an increased incidence of diarrhoea and upper respiratory infections. Lesions were most common in the kidney, salivary gland and lung, and consisted of calcium and iron deposits often associated with a "foreign body" type of reaction. Animals examined a year after exposure had few lesions.

SUTER, P. (1957). Zur Gefahr der Überdosierung von Vitamin-D-Präparaten. **[Danger of overdosage with vitamin D preparations.]**—*Schweiz. Arch. Tierheilk.* **99,** 421-433. [Summaries in English, French and Italian.] **2595**

A 4-month-old dog weighing 5 kg. received, within 2 weeks, 2·4 million i.u. of vitamin D intramuscularly, and a cat, treated for a skin disease, received within 6 months 5 million i.u. of vitamin D_3 and 2·5 million i.u. of vitamin A by mouth. Both animals died, the dog with symptoms of uraemia. Large calcifications were observed in various organs and in the blood vessels. Hypofunction of the thyroid gland was found in the dog, revealing a low degree of tolerance to the vitamin.—M.G.G.

HARTLEY, W. J. & DODD, D. C. (1957). **Muscular dystrophy in New Zealand livestock.**—*N. Z. vet. J.* **5,** 61-66. **2596**

A detailed account is given of the clinical appearance and P.M. findings in white muscle disease of lambs and hoggets in New Zealand. In a small group of affected lambs the mean total tocopherol content of the plasma was 74 μg. per 100 ml., whereas in healthy lambs it was four times as much. Mothers of affected lambs had more tocopherol in the plasma than ewes with healthy lambs, but only half as much in the milk. One affected lamb on the second day after oral dosing with 250 mg. α-tocopherol acetate had a plasma tocopherol content of only 8 μg./100 ml. The possibility of anti-vitamin E substances in the milk is suggested. A controlled field trial with hoggets showed that drenching with 500 mg. of α-tocopherol acetate at 14-day intervals for 3 months protected them from muscular dystrophy after driving.

Muscular dystrophy of calves, foals and poultry in New Zealand is described also, and a congenital form seen in lambs.—M.G.G.

LEE, C. P. & KING, J. T. (1958). **Effect of methylene blue on mouse "paralysis" and heart failure.**—*Fed. Proc.* **17,** 94. [Authors' abst. modified.] **2597**

Vitamin E deficiency produced fibrosis of cardiac muscle and heart failure (*J. Geron.* **11,** 364, 1956) but E deficiency alone did not cause severe degeneration of skeletal muscle or "paralysis" (*Fed. Proc.* **15,** 117, 1956). Adding 0·05% methylene blue to a diet which produces nearly 100% incidence of "paralysis" in mice prevents "paralysis" but does not prevent the

heart failure produced by this diet. In fact the incidence of heart failure is increased from about 45 to 90%. Adding trace elements has essentially the same effect. Adding trio-O-cresylphosphate 0·1% does not cause "paralysis" when trace elements are present in the diet although it suppresses growth rate and reduces the life span from 351 to 248 days. In the absence of trace elements the anti-vitamin decreases the age of onset of "paralysis."

WILLIAMS, A. D., FINK, K. & FINK, R. M. (1958). **Metabolic changes in vitamin E deficiency.**—*Fed. Proc.* **17,** 336. [Authors' abst. modified.] **2598**

In rabbits on a diet deficient in vitamin E, the adenosine triphosphate content of muscle decreased before overt dystrophy developed. Increased urinary excretion of 1-methylhistidine and the appearance of urinary creatine preceded the depression of adenosine triphosphate. Studies *in vitro* with surviving muscle fragments from vitamin E-deficient rabbits revealed a significant incorporation of formate-C^{14} into serine, methionine, hypoxanthine and inosine, whereas with similar preparations of normal muscle, the incorporation was either not detected or was seen only in traces. The highest proportion of ultra-violet absorbing material in the normal muscle incubation media was present as inosinic acid, with moderate amounts of inosine and low levels of hypoxanthine. In the media from incubated vitamin E-deficient muscle, hypoxanthine represented the major portion of the ultra-violet absorbing material, inosine levels were relatively low, and inosinic acid was virtually absent. These differences were also noted before the appearance of physical symptoms of muscular dystrophy.

CREECH, B. G., RAHMAN, M. M., REID, B. L. & COUCH, J. R. (1958). **Exudative diathesis in chicks.**—*J. Nutr.* **64,** 55-65. [Authors' summary modified.] **2599**

In chicks fed a diet with torula yeast as the protein source, exudative diathesis was the primary symptom. The condition was totally unrelated to the function of vitamin E as an antioxidant, and its appearance did not depend on the addition of stressing agents, such as fats, to the diet. It was prevented by supplementation with vitamin E or dried brewers' yeast. Severe exudative diathesis had a marked influence on the composition of blood and serum. The development of gross symptoms was paralleled by decreases in haemoglobin, total serum protein values, and serum albumin. The accompanying anaemia was due primarily to haemorrhage.

BIERI, J. G., BRIGGS, G. M. & POLLARD, C. J. (1958). **The acceleration of vitamin E deficiency in the chick by torula yeast.**—*J. Nutr.* **64,** 113-126. [Authors' summary modified.] **2600**

Chicks were fed purified diets essentially free from vitamin E, Factor 3 and selenium, in which amino-acids or soya-bean protein were the sources of nitrogen. The addition of 7·5% to 30% of torula yeast to these diets accelerated the development of exudative diathesis. This effect was not associated with the lipid component of the yeast. Washing the yeast with water did not remove the activity. An ash of the yeast, however, promoted exudates. The storage of injected α-tocopherol was impaired in chicks fed a high torula yeast diet compared with chicks fed a soya-bean protein diet. It appears that the exudate-producing activity is associated with the mineral component of the yeast.

I. RERAT, A., LE BARS, H. & MOLLE, J. (1958). Utilization d'une méthode de perfusion pour la mise en évidence de l'absorption des vitamines B chez le mouton normalement alimenté. **[Use of a perfusion method for studying vitamin B absorption in normal sheep.]**—*C. R. Acad. Sci., Paris* **246,** 1920-1922. **2601**

II. RERAT, A., MOLLE, J. & LE BARS, H. (1958). Mise en évidence chez le mouton de la perméabilitié du rumen aux vitamines B et conditions de leur absorption à ce niveau. **[Demonstration in sheep of the permeability of the rumen to B vitamins and conditions governing their absorption from the rumen.]**—*Ibid.* 2051-2054. **2602**

I. Perfusion with blood of the small intestine or the rumen of intact sheep [for technique see Le Bars *et al. Bull. Acad. vét. Fr.* (in press)] revealed that niacin, pantothenic acid and vitamin B_{12} were absorbed from the small intestine but not from the rumen.

II. The absence of absorption of B vitamins from the rumen was due not to the impermeability of the organ to the vitamins, but to the irresorbable nature of the vitamins at this level. The rumen wall was permeable to B vitamins in their free state.—R.M.

GANTT, W. H., CHOW, B. & SIMONSON, M. (1958). **Effect of vitamin deficiency on behavior in rats.**—*Fed. Proc.* **17,** 51. **2603**

Lack of natural food nutrients and vitamins even when diet is supplemented by all known prepared vitamins causes some disturbances of behaviour; these disturbances are greatly exaggerated when pyridoxin is also withheld

from the artificial diet. Pyridoxin is therefore essential for normal higher nervous activity in rats, perhaps comparable to human mental function.—R.M.

RANGNEKER, P. V. & DUGAL, L. P. (1958). **Studies on the amino acids in the blood plasma of scorbutic guinea pigs.**—*Canad. J. Biochem. Physiol.* **36**, 25-27. **2604**

Striking differences were observed in the assortment of amino-acids obtained in a comparative study made on the plasma amino-acids in scorbutic and nomal g.pigs. Arginine, cystine, hydroxyproline and threonine while present in the plasma of normal g.pigs were absent in the plasma of ascorbic acid deficient g.pigs. Quantitative estimations made on some amino-acids demonstrated that plasma values of alanine, glutamic acid, glycine, leucine, serine and valine were lower and values of histidine, lysine and phenylalanine were higher in scorbutic g.pigs than in normal g.pigs.—R. V. L. WALKER.

SØRENSEN, P. H. (1958). Jodstofskifte og thyreoideafunktion hos kvaeg og svin. [**Iodine metabolism and thyroid function in cattle and pigs.**] — *Beretn. Forsøgslab. Kbh.* No. 302. pp. 159. [In Danish. Summary in English.] **2605**

In cattle and pigs the concentrations of protein-bound iodine (PBI) in the serum rose in winter and fell in summer; while high concentrations of iodine in the thyroid gland were found in late summer and autumn, and low conc. in the spring. Bullocks had lower thyroid secretion rates and lower conc. of PBI in the serum than heifers of the same ages. The concentrations of serum PBI were higher in pregnant than in non-pregnant cattle, but no significant differences were found in thyroid secretion rate. Thyroid secretion rate and conc. of serum PBI increased with rising butter-fat production. The possibility of predicting the milking potential of heifers from thyroid secretion rate is discussed.

—M.G.G.

REBER, E. F. (1957). **Pregnancy disease in ewes: observations relating to treatment and the metabolic pathways involved.**—*N. Amer. Vet.* **38**, 353-355 & 359. **2606**

Experimental hypoglycaemia and then ketosis (resembling the natural disease "pregnancy toxaemia") can be produced by simple fasting of ewes. The hormone glucagon from the alpha cells in the pancreas which promotes the liberative breakdown of liver glycogen has proved promising in therapeutic trials. The detailed biochemistry of glucose-fat conversion is described, and also that of the gluconeogenesis from amino-acids, which probably occurs in multiple pregnancy. The theoretical expectation that dosage with oxalacetic acid would raise the blood glucose level, was confirmed experimentally.—F. L. M. DAWSON.

ADLER, J. H. & DYE, J. A. (1957). **The special status of the rumen flora. Comparative aspects of digestive enzymes, their regulation and relation to indigestion.**—*Cornell Vet.* **47**, 506-514. **2607**

The relationship between the rumen flora and the host is discussed with emphasis on the regulatory mechanisms which control the activity of the flora. Various external factors have a pronounced effect on the flora and the possible relationship between these and diseases such as ketosis is considered.—E. J. CASTLE.

See also abst. **2705** (report, Netherlands).

DISEASES, GENERAL

REID, W. M., PATE, D. P. & KLECKNER, A. L. (1958). **Effects of *Ascaridia galli* on chicks with infectious bronchitis.**—*Avian Diseases* **2**, 99-109. [Authors' summary modified.] **2608**

In four experiments in 3-week-old chicks a combination of infectious bronchitis and *Ascaridia galli* infection resulted in a mortality of 5·5, 3·2, 1·1, and 2% respectively. None of the controls died with single infections of bronchitis or with worms alone. Average weight gains were less with the combined infection than with either infection alone. A worm infection of an average of 4·3 worms per bird, uncomplicated by infectious bronchitis, caused some depression in weight gain. Feed consumption was depressed 22% by double infection, 13% by infectious bronchitis, and 1% in the worm infected groups.

KULCZYCKI, J. (1957). Ropniaki jam stawowych i pochewek ścięgnowych kończyn koni. [**Purulent arthritis and tendovaginitis in horses.**]—*Roczn. Nauk rol.* **68**, Ser. E. 189-206. [In Polish. Summaries in English and Russian.] **2609**

An account of 14 cases, 13 of which were treated by aspiration of the synovial fluid and introduction of penicillin into the joint cavity. 10 horses responded well to this treatment and one to i/m injections of penicillin and strepto-

mycin. The latter treatment is however more expensive and requires several applications.

—M. Gitter.

Clark, C. H. (1957). **A survey of dairy herd wastage in Queensland.**—*Qd agric. J.* **83,** 653-658. **2610**

The data are derived from herd recording groups from 1948 to 1955. Over this period rainfall was mostly above normal except for a drought season 1951–52. The average herd composition was: cows 61%, bulls 2%, heifers 21% and calves 16%. The average wastage of cows was 16·8% excluding those sold for dairy purposes. Principal reasons for disposal, in order of importance, were low production, old age, sale of surplus stock, udder troubles, sterility and abortion. The average wastage of bulls was 21·9% and of heifers from weaning till calving 9·6%. About 60% of all heifer calves born each year were reared.

—R. I. Sommerville.

Reynolds, S. R. M. & Paul, W. M. (1958). **Cardiovascular responses of fetal lamb in utero to hypoxia.** — *Fed. Proc.* **17,** 132. [Authors' abst. modified.] **2611**

Records of foetal blood pressure and heart rate *in utero* were made to explore the circulatory response to graded degrees of hypoxia. When the ewe was subjected to 13, 10 and 6% O_2, the foetal heart rate slowed, increased slightly, or fluctuated. Diastolic pressure remained nearly constant but systolic pressure invariably increased, indicating improved cardiac output. On 6% O_2 the heart rate slowed, blood pressure declined and pulse pressure decreased, not invariably so. When blood pressure fell, heart rate was also slowed. The results show that heart rate alone is not a reliable criterion of foetal distress. The O_2 tension associated with fall in blood pressure (and usually heart rate) was 10 mm. Hg or less. Heart rate was affected when O_2 tensions were between 10–30 mm. O_2 tension. Initial or early cardiac slowing may be inhibited by injection of atropine into the foetus.

Gale, C. & Wyne, J. W. (1957). **Preliminary observations on hemorrhagic enteritis of turkeys.**—*Poult. Sci.* **36,** 1267-1270. [Authors' summary modified.] **2612**

Two outbreaks of haemorrhagic enteritis in turkeys were observed. The mortality rate was low, 1·6% and 3·5% of each flock of 1100 turkeys affected. Bacteriological and viral examination failed to reveal the cause. The course was 21–24 days in uncomplicated outbreaks. The gross lesions and environmental conditions are discussed.

Rigdon, R. H., Ferguson, T. M., Feldman, G. L., Stelzner, H. D. & Couch, J. R. (1958). **Spontaneous hernias in the axilla of the turkey.** — *Poult. Sci.* **37,** 169-173. [Authors' summary modified.] **2613**

Hernia in the axilla of young turkeys may be produced by rough handling, which obstructs the trachea and increases intrathoracic pressure. The membrane separating the respiratory tract from the cavity in the axilla is very thin and apparently can be ruptured easily. In young turkeys there is little support over the axillary cavity; however, as the birds age, this area is filled with fat and muscle and becomes more resistant. These hernias are only local protrusions of skin and the membrane lining the axillary cavity. They are filled with air and regress progressively with age.

Innes, J. R. M., Donati, E. J. & Yevich, P. P. (1958). **Pulmonary lesions in mice due to fragments of hair, epidermis and extraneous matter accidentally injected in toxicity experiments.** — *Amer. J. Path.* **34,** 161-167. [Authors' summary modified.] **2614**

Fragments of hair, epidermal scales, and other unidentifiable extraneous matter caused embolic and granulomatous lesions in the lungs of mice, after being accidentally introduced by injection into the tail vein. Repeated daily injections increased the incidence of these lesions. Unsterilized or even unwashed needles are commonly used for i/v injection into mice, often for a very large number of animals.

Mizuno, N. S., Perman, V., Bates, F. W., Sautter, J. H. & Schultze, M. O. (1958). **Life span of thrombocytes and erythrocytes in normal calves and in calves with hypoplastic anemia.** — *Fed. Proc.* **17,** 277. [Authors' abst. modified.] **2615**

Thrombocytes from normal and from moderately thrombocytopenic calves contain cholinesterase, the activity of which decreases after administration of diisopropyl phosphorofluoridate (DFP). Injection of DFP did not affect the function of thrombocytes, nor did it affect the rate of disappearance of thrombocytes transfused into severely thrombocytopenic calves. To estimate the life span of thrombocytes and erythrocytes, radioactive DFP (5 mg./100kg. body wt.) was injected i/m into normal calves and into calves with moderate thrombocytopenia induced by feeding of

trichlorethylene-extracted soyabean oil meal. The radioactivity of erythrocytes and of thrombocyte concentrates was measured and expressed as cpm/10^9 cells. The slope of radioactivity time curves indicated a life span of thrombocytes of about 10 days and a life span of erythrocytes of about 115 days; there was no significant difference between normal calves and calves with hypoplastic anaemia.

SILVERMAN, M. S., GREENMAN, V., CHIN, P. H. & BOND, V. P. (1958). **Bacteriological studies on mice exposed to supralethal doses of ionizing radiations. II. Fast neutron and X-radiation from laboratory sources.**—*Radiation Res.* **8,** 123-130. [Authors' summary modified.] **2616**

Infection with one or more species of endogenous enteric bacteria occurred in a high percentage of mice after exposure to supralethal doses of neutron radiation (510 rads) or X-radiation (1340 rads), doses which result in death within 5 days probably from gastro-intestinal injury. The incidence of infection was parallel to the increase in deaths. During the first 60 hours bacteria were isolated primarily from the spleen. After that time bacteraemia developed.

Daily s/c injection of 10 mg. of streptomycin and 4000 units of penicillin greatly reduced the incidence of infection but did not alter eiher mortality rate or mean survival time of the neutron-irradiated mice, although the mean survival time of the X-irradiated mice was lengthened. It is concluded that infection plays only a minor role, if any, in causing death after exposure to these doses of ionizing radiation.

LADELL, W. S. S. (1957). **Disorders due to heat.** — *Trans. R. Soc. trop. Med. Hyg.* **51,** 189-207. Discussion: pp. 207-216. **2617**

This is a very important and deliberately provocative paper in that, not only does it summarize the results of many years of work on disorders in man due to heat, but it describes a revolutionary outlook on the function of salt in human metabolism.

As the result of his unequalled experience of the behaviour of man in hot conditions L. has formed the opinion that the functions of salt in metabolism have been misunderstood. He traced the reactions of man to salt. It has played a spectacular role in the evolution of human civilization. To early man, the hunter, salt was a luxury; as crop growing developed salt was probably added to the vegetable pap to give a taste comparable with that of blood. The great trade routes of the past—from 4000 years ago—were routes of salt movement. It was an expensive item of diet and at some stages the perquisite of kings. All through it can be classed as a luxury, not as a necessity. Ladell said: "I consider salt to be the first great addiction of the world."

The "normal" salt intake of a human being is not known. Phylogenetically man is a tropical animal and the sweating state is, therefore, a natural one. It has been shown experimentally that man can exist, work and remain healthy in a hot environment with very little salt and the author observes that this is not only a laboratory observation, but also an anthropological and sociological fact. In Nigeria there is virtually no indigenous salt-making and almost all the salt used is imported. It has been estimated that the salt available in Nigeria is not more than 7 g. per man per day, including the amount used for industrial purposes and for re-export. Not much sodium chloride is obtained from the food; the population lives largely on vegetable products and hence the potassium, but not the sodium, intake is high. Similar pictures are found in other tropical countries but tropical peoples do not, apparently, suffer from salt deficiency. The author suggested that primitive man had an active adrenal cortex, with an adequate production of aldosterone to control the electrolyte metabolism and so conserve his very limited salt intake.

Ladell classified the heat disorders of man into minor disorders such as Sunburn, Prickly Heat and Heat Syncope; and major disorders such as Heat Exhaustion, Heat Cramps, Tropical Anhidrotic Asthenia, and Hyperpyrexia.

In PRICKLY HEAT, the mouths of the sweat glands become blocked with a plug of keratinized cells. It has been suggested that the blocking of the sweat glands results from the washing away of the normal skin oil. There may also be an infective element. The relation of the salt intake to prickly heat is unsettled.

HEAT SYNCOPE. Fainting is one of the commonest causes of incapacitation in warm conditions. When the blood volume is insufficient for an expanded vascular bed there is a poor venous return with resultant effects on blood pressure and the onset of syncope. Resistance to heat syncope is one of the earliest advantages acquired by acclimatization.

HEAT EXHAUSTION occurs in well-adapted persons, usually brought on by an additional effort when conditions suddenly become hotter. The patient is exhausted, with pale, sweating skin, a slightly raised temperature and a high pulse rate. There is dehydration and weight loss; the urine is scanty, deeply pigmented and chloride-free. There is haemo-concentration and

a fall in the blood electrolytes. Recovery does not occur merely on removal to improved environmental conditions; treatment is required.

Heat Cramps are an almost inevitable consequence of a low concentration of sodium in extra-cellular fluids and associated with hard work in heat and are promptly relieved by hypertonic saline given intravenously. The aetiology is not as well understood as had been believed.

Tropical Anhidrotic Asthenia occurs at the end of long periods of hot weather as a slowly developing weakness; there is no collapse. The typical complaint is of lack of energy, failure to sweat properly and an embarrassing polyuria, but on examination there is little obviously wrong. L. found some tachycardia and a slightly raised systolic blood pressure. The skin was warm and the body temperature approaching 101°F. The urine always contained chloride, but plasma chloride was usually slightly below normal. It could be difficult to distinguish these cases from malingering.

Hyperpyrexia strikes suddenly. There is cessation of sweating and the body temperature rises unchecked. Between 105° and 107°F. unconsciousness supervenes, but the temperature continues to rise and it may exceed 110°F. when death occurs. At autopsy the only lesions found consistently are cerebral oedema and petechial haemorrhages in the hypothalamus. There is never recovery without active treatment. An artificial sweat is the best remedy and this is better than cooling with ice for both physiological and physical reasons.

The Aetiology of Heat Exhaustion and Heat Cramp. No man working hard in heat, drinks ounce for ounce as he sweats. Some people consistently fail to drink enough. Thus a chronic water debt is common and L. considers that it is the water debt and not salt deficiency that is the main cause of the weight loss. While a slight water debt is a commonplace in the Tropics, in the absence of an emergency it is of no great importance.

In a man who is sweating, but taking some water and no salt, the total body water may be reduced by about two litres before the intracellular water (intracellular fluid, ICF) is affected; about the same amount of water has also to be lost before there is a gross diminution in salivation during water deprivation or before the basal urine flow is achieved. L. regards this non-essential water as the water that is normally in the saliva, and in the gastric and intestinal juices, and makes the point that it is "in" the body, but not "of" it and speaks of it as the "hump", the last reserve of water that can be used without the organism becoming inefficient. It is the loss of this "hump" that makes man susceptible to heat exhaustion.

L. discussed the general position and also his own extensive investigations concerning the intricate relationships in individuals, working in hot conditions, of water and salt intake and excretion with regard to the effects of the composition and volume of the E.C.F. [extracellular fluid] and the I.C.F. and the sweat and the co-ordinating mechanism of the adrenal cortex, with special reference to the control of the electrolyte metabolism by aldosterone.

The Aetiology of Tropical Anhidrotic Asthenia. There is some evidence that prickly heat may play a role in tropical anhidrotic asthenia. Most of the symptomatology may be explained, first by failure of the renal tubules to respond to antidiuretic hormone (A.D.H.) which leads to an excessive production of A.D.H. which may suppress sweating. There is also diminished activity of the adrenal cortex which leads to electrolyte imbalance and asthenia.

The Aetiology of Hyperpyrexia. The aetiology of the dramatic and drastic failure of the heat regulation in hyperpyrexia is unknown. Some clinical evidence suggests super-hydration and polyuria and L. considered that there might be an affinity between hyperpyrexia and anhidrotic asthenia. He also found an affinity with the condition that has been called sweat gland fatigue. In the normal person the response of the sweat glands was found in tests to become progressively less as the rectal temperature rose. The falling off in the sweat rate was not, however, a true fatigue as it was reversible. He regarded hyperpyrexia as a purely physiological phenomenon. With a rise in body temperature, even for physiological reasons, there is danger and anything that interferes with cooling or adds to the internal heat load increases the danger. He commented that the wonder is that the condition is not much commoner.—W.A.P.

See also abstr. **2709** (diseases of domestic animals in New Zealand); **2710** (book, veterinary ophthalmology); **2711** (book, diseases and parasites of poultry).

POISONS AND POISONING

BÉLANGER, L. F., VISEK, W. J., LOTZ, W. E. & COMAR, C. L. (1958). **Rachitomimetic effects of fluoride feeding on the skeletal tissues of growing pigs.** — *Amer. J. Path.* **34**, 25-35. [Authors' summary modified.] **2618**

Young pigs, fed for 30, 60 or 90 days on a diet containing 1,000 p.p.m. of sodium fluoride, showed defective growth and mineralization of bones, costochondral beading, softened and deformed epiphyseal plates, and enlarged and malformed bone trabeculae. Histochemical studies of demineralized sections revealed a decrease in stainable polysaccharides and an accumulation of a salt, in solubility resembling calcium fluoride. The larger portion of the deposit observed in incinerated sections of demineralized tissue seemed related to an organic calcium combination, the significance of which is discussed in relation to the mechanism of mineralization and to vitamin D deficiency and strontium rickets.

HAMMOND, P. B., WRIGHT, H. N. & ROEPKE, M. H. (1957). **A method for the detection of lead in bovine blood and liver.**—*Tech. Bull. Univ. Minn. agric. Exp. Sta.* No. 221. pp. 14. [Authors' summary modified.] **2619**

An account of a simplified method for detecting lead in cattle blood and liver, involving protein precipitation with trichloracetic acid, development of a colour reaction by treatment of the supernatant with two reagents, and estimation of lead concentrations by visual comparison with a series of colour blocks. The procedure is sufficiently simple for extensive use as a diagnostic aid in diagnostic laboratories.

The characteristics of the colours developed enable an estimation of the concentrations of lead present in blood and liver. A consideration of the authors' data on blood and liver lead concentrations in normal cattle as opposed to those found in cases of lead poisoning indicates that a clear colour differentiation is usually possible.

SALISBURY, R. M., STAPLES, E. L. J. & SUTTON, M. (1958). **Lead poisoning of chickens.**—*N. Z. vet. J.* **6**, 2-7. [Authors' summary modified.] **2620**

A review of the literature on lead-poisoning in game birds is given.

The results are given of feeding massive single doses of basic lead carbonate and red lead to fowls. These compounds are non-toxic if given in a state in which they will not be retained in the gizzard.

A severe mortality in chickens as a result of feeding grit with an extremely high content of lead is described. The most important P.M. lesion was a severe necrosis of the gizzard lining. The severity of these lesions was closely correlated with the liver lead levels.

Laboratory trials show that the susceptibility to lead intoxication decreases with age.

STAPLES, E. L. J., SALISBURY, R. M. & VAN DER WOUDEN, M. (1958). **A heavy mortality in lambs following parenteral administration of diethylamine acetarsol.**—*N. Z. vet. J.* **6**, 7-11. [Authors' summary modified.] **2621**

A field case is described in which heavy mortality occurred among unthrifty lambs following parenteral administration of diethylamine acetarsol. Experiments carried out showed that:- (1) Diethylamine acetarsol equivalent to 20 mg. arsenic was non-toxic when given i/m to normal, healthy lambs. (2) The equivalent of 100 mg. arsenic as diethylamine acetarsol given i/m could be fatal to lambs of 40 lb. body wt. (3) Diethylamine acetarsol equivalent to 20 mg. arsenic was toxic when given i/m to dehydrated lambs.

It seems likely that dehydration in the field case described could have been the predisposing cause of the mortality. Where death from organic arsenicals is suspected, chemical diagnosis should be based on the analysis of kidney rather than liver tissue.

BĄK, T. & BABIEŃ, Z. (1958). Zatrucie jałówek siemieniem inianym. **[Linseed poisoning in cattle.]**—*Méd. vét., Varsovie* **14**, 24-27. [In Polish. Summaries in English and Russian.] **2622**

An account of an outbreak affecting nine heifers, 6 months old, of which four had to be slaughtered. The clinical symptoms, which appeared about half an hour after drinking a decoction of linseed, were weakness, staggering, tympany and collapse.—M. GITTER.

CARTER, P. D. (1958). **Outbreak of photosensitisation in cattle.** In "The Stock Inspector" 1957 pp. 47-48. [Sydney: Institute of Inspectors of Stock of N.S.W.] **2623**

Over a period of 8 days, all adults and the older calves in a herd of 36 beef cattle developed severe prostration with discharge from the eyes and nose, hardening of the skin in various areas, and jaundice in some. Fifteen died. The condition was considered a photosensitization and it was strongly suspected that aphis-infested thistles were the cause.—A. ACKROYD.

GENTRY, R. F. (1958). **The toxicity of certain antibiotics and furazolidone for chicken embryos.**—*Avian Diseases* **2**, 76-82. [Author's summary modified.] **2624**

When 10-day-old chick embryos were inoculated with eight antibiotics and two forms of furazolidone, deaths occurred during the first six days after inoculation with lesions of oedema and haemorrhage. Embryos surviving after this time developed and hatched at a normal rate.

Antibiotics varied greatly in their toxicity, the embryo LD_{50} of those tested ranging from 0·96 to 152·5 mg. Toxicity was markedly influenced by the route of inoculation. Antibiotics were 5-6 times as toxic when inoculated on the inner shell membrane of the air cell than when inoculated into the yolk sac or allantoic cavity.

Furazolidone, which is relatively insoluble in water, did not readily diffuse through the inner shell membrane and was least toxic when injected by this route.

ORTEGA, P. (1958). **Hepatocellular pathology following various chlorinated hydrocarbon insecticides.**—*Fed. Proc.* **17**, 451. [Author's abst. modified.] **2625**

Positive microscopic findings in 289 rats fed various chlorinated hydrocarbons were confined to the liver. DDT was fed to 241, while 48 received various other compounds, including Chlordane, Dieldrin, lindane, and Toxaphene. The chemical was incorporated into a ground meal and given orally at from 2·5 to 5,000 p.p.m. Exposure varied from 1 week to 20 months. Reversibility of toxicity was tested in 96 of the animals given DDT. Significant alterations were noted in cell size and cytoplasmic RNA distribution in the liver. Characteristic cytoplasmic inclusion bodies were frequently elicited by hydrocarbons. Cell damage was detected at minimal dietary levels of 2·5 p.p.m. with Chlordane, 2·5 p.p.m. with Dieldrin, 5 p.p.m. with DDT, 50 p.p.m. with lindane, and 50 p.p.m. with Toxaphene. Cytoplasmic inclusions proved useful in detecting liver cell changes at extremely low levels of exposure. These inclusions had a complex internal structure and a predominantly lipoprotein composition. Ready reversibility of these lesions was demonstrated when extremely high dosage was avoided. In the latter instance focal necrosis occurred. Incidental findings suggested marked changes in sinusoidal permeability as characterized by hepatocellular inhibition of plasma and red blood cells.

ERNE, K. (1958). **Detection and quantitative determination of parathion in biological materials.**—*Acta pharm. tox., Kbh.* **14**, 173-187. [In English.] **2626**

E. developed a specific and sensitive method for the determination of parathion and its main degradation product, *P*-nitrophenol, in biological materials. The method was tested on tissues from experimentally poisoned pigs. —R.M.

FRUNDER, H., BÖRNIG, H., RICHTER, G. & STADE, K. (1957). Der Stoffwechsel geschädigter Gewebe. Die Stoffwechselveränderungen in der Leber 4 bis 48 Stdn. nach Tetrachlorkohlenstoff-Vergiftung. **[Metabolic changes in the liver 4–48 hours after carbon tetrachloride poisoning.]** — *Hoppe-Seyl. Z.* **307**, 161-175. [Summary in English.] **2627**

I/p inj. in mice of a 1:7 suspension of CCl_4 in vegetable oil reduced greatly the diphosphopyridine nucleotide and glucose content of the liver, whilst conc. of total acid-soluble phosphorus, inorganic phosphorus and lactic acid was increased. As compared with control experiments using pure oil, the adenosine triphosphate level was reduced whilst adenosine mono- and diphosphate levels remained constant. These changes were considered to have been caused by disturbance of the mitochondrial function by CCl_4 [See also *V.B.* **27**, 1233.]—E.G.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

ZABOLOTNUII, I. I. (1958). **[Preparations of liver and spleen as growth stimulants for piglets.]**—*Veterinariya, Moscow* **35**, No. 2. pp. 74-75. [In Russian.] **2628**

In 2 groups of pigs, one of 14 healthy animals and the other of 40 animals with anaemia due to helminth infestation, some were inoculated s/c with liver extract, some with spleen extract, and the remainder served as controls. The dosage was 0·1-0·2 ml./kg. body wt. twice in 8-10 days, the trial lasting 30 days. Treated pigs grew faster than controls, particularly in the group with anaemia. From a starting wt. of about 14 kg. anaemic pigs receiving extract gained about 6½ kg. in 30 days, whereas controls gained only 3 kg. A rise in haemoglobin and erythrocyte content of the peripheral blood was also seen in this group.—M.G.G.

PRESCOTT, B., KAUFFMANN, G. & JAMES, W. D. (1958). **Effect of glycerine on toxicity of isoniazid-streptomycin mixtures in mice.**—*Antibiot. & Chemother.* **8,** 81-83. [Summary in Spanish p. 110. Authors' summary modified.] **2629**

Mixtures of isoniazid and streptomycin in water were more toxic in 2 strains of mice than either therapeutic agent alone. Use of 35% glycerol soln. as solvent increased the tolerated dose of such mixtures. No antagonism was found with the mixtures in either aqueous or glycerol soln. in *in vitro* tests of bacteriostatic action against an avirulent strain of *Mycobacterium tuberculosis.*

SNELL, J. F., THANASSI, F. Z. & SYPOWICZ, D. A. (1958). **Studies in metabolic spectra. I. Mode of action of tetracycline antibiotics.**—*Antibiot. & Chemother.* **8,** 57-75. [Summary in Spanish p. 109. Authors' summary modified.] **2630**

A systematic technique is suggested for studying the mode of action of compounds. The technique consists of choosing suitable medium, organism, and conditions; adding a radioactive indicator compound before, along with, or after the compound under study; incubation; extraction of broth or cells for suitable fractions; chromatography of the fractions in diverse systems; scanning of the chromatograms quantitatively for outstanding differences; and characterization of the compounds in which differences are found. The technique is illustrated with data on the action of the broad-spectrum antibiotics against *E. coli* 21 and 21T, using orthophosphate and methyl-labelled acetate as radioactive indicator compounds.

CALET, C. (1958). Influence de l'aureomycine sur la régénération du foie après hépatectomie partielle chez le rat blanc et chez le poulet. [**Influence of chlortetracycline on liver regeneration after partial hepatectomy in rats and chicks.**]—*C. R. Acad. Sci., Paris* **246,** 2048-2051. **2631**

Chlortetracycline inhibited liver regeneration in adult rats and in chicks, although it also increased the growth of the chicks. Evidently the growth-promoting action of this antibiotic could not be attributed to increased protein formation.—R.M.

HANSSON, C.-H. (1957). **Clinical observations on casting horses and cows with succinylcholine.**—*Nord. VetMed.* **9,** 753-762. [In English. Summaries in German and Swedish.] **2632**

A thousand horses and 140 cattle were cast without using ropes by i/v inj. of succinylcholine iodide, using 0·17 mg./kg. body wt. for Thoroughbred and other saddle horses, 0·13 mg./kg. for draught horses, and 0·02 mg./kg. for cattle. Casting was successful at the first attempt in all except 6 cases: in these the inj. had to be repeated. One horse in poor condition and one cow died after casting. The risk of bone fractures was considerably less than with ordinary casting methods.—R. M.

REED, W. C., ALLEN, C., GLASSER, M. E. & KEEFE, E. R. (1957). **An apparatus for administration of ether anesthesia in horses.**—*Vet. Med.* **52,** 474-476. **2633**

Rapid vaporization of ether was achieved by connecting 4 vaporizers in parallel to an aluminium face mask. During induction oxygen was blown through the ether into the mask. After induction a closed circuit came into use, in which expired air passed through a soda-lime canister. The whole apparatus was compact and readily portable.—R.M.

See also abstr. **2393** (persistence of tubercle bacilli in organs of g.pigs following chemotherapy); **2402** (oxytetracycline in equine ulcerative lymphangitis); **2407** (polymyxin B and oxytetracycline in Ps. pyocyanea infection); **2408** (action of antibiotics on E. coli); **2419** (brucellosis); **2425-2426** (leptospirosis); **2432** (tetanus); **2441** (inactivation of chlortetracycline); **2442** (moniliasis); **2451** (sensitivity of P.P.L.O. to chemotherapeutics); **2455** (glaucarubin in protozoan diseases); **2506** (turkey ornithosis); **2522-2523, 2525, 2528-2529 & 2625-2627** (parasiticides); **2541-2546 & 2627** (anthelmintics); **2566-2568** (antibiotic supplements for chicks); **2621** (toxicity of diethylamine acetarsol for lambs); **2624** (toxicity of antibiotics and furazolidone for chick embryos); **2657** (chlortetracycline in meat preservation); **2712** (book, nonofficial drugs).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

MACFARLANE, W. V., MORRIS, R. J. H. & HOWARD, B. (1958). **Heat and water in tropical Merino sheep.**—*Aust. J. agric. Res.* **9,** 217-228. [Authors' summary.] **2634**

The relation between environment and the water intake and output of young Merino sheep living in the hot dry tropics on lat. 21°S. has been studied for 3 years. The tip wool of sheep standing in the sun heats to 189°F by absorption of radiant energy, most of which is reradiated. Wool, especially when it is more than 3 cm long, assists in protecting sheep from radiant energy. The respiratory rates of sheep shorn during summer were more than twice those of unshorn sheep standing in the sun. On the open plains summer shearing appears to add to the thermal strain. Acclimatizing sheep respired more rapidly in the sun than tropical sheep. Evaporative cooling, by panting, increases water demand, and in summer Merinos

drank on the average 12 times as much water as in winter, when they took 7·3 ml/kg/day. Water intake is related closely to respiratory rate. Urine output was lower in summer than in winter.

BARNICOAT, C. R. (1957). **Wear in sheep's teeth.** —*N. Z. J. Sci. Tech.* Sect. A. **38,** 583-632. **2635**

The quality of sheep's mouths in New Zealand has deteriorated during the last 30 or 40 years. This deterioration is associated with increased consumption of high-yielding European grasses. Comparison of the teeth of sheep on different types of pasture revealed that they wore most rapidly on perennial ryegrass and white clover and least of all in scrub country where food consists of succulent weeds and leaf shoots. No chemical, physical or histological differences were found between teeth with varying amounts of wear and there was no clear correlation with the mineral content of the soil. Dosing with vitamin D did not check tooth wear. The wear is apparently due to the solvent action of certain substances in growing pasture, coupled with the abrasive action of the fibre in the grass. Overstocking, which forces sheep to graze the fibrous crowns of the grass, causes excessive wear. In a field trial sheep subjected to pasture rotation had less wear of the teeth than sheep which had not been managed in this fashion. As tooth wear varies considerably in individual animals on the same pasture, it is considered that selection for mouth quality in ewes and rams would check the deterioration. A reduction in carrying capacity, the stocking of pastures with cattle alongside the sheep, controlled grazing methods, and early weaning would also improve the quality of teeth.

—M.G.G.

DIXON, A. D. (1957). **Occlusion in sheep—some breeding experiments.**—*Dent. Practit.* **7,** 172-177. **2636**

D. investigated premature loss of incisor teeth in Cheviot ewes in Scotland and found that it was due to a slightly undershot occlusion leading to oblique wear and loosening of teeth, with gingivitis (Type 2 occlusion according to Hitchin, *Dent. Rec.* **68,** 251, 1948). With a more normal occlusion (Type 1) the jaw was not undershot and the teeth were worn flat. By breeding the ewes with 6 rams having Type 1 occlusion the proportion of lambs with Type 2 occlusion was reduced to 28% and the problem of early loss of teeth ceased. Subsequently a similar condition was observed in Blackface ewes, and it was found that only one-third of the rams used had Type 1 occlusion.—R.M.

QUEVEDO, W. C., JR. & GRAHN, D. (1958). **Effect of daily gamma-irradiation on the pigmentation of mice.**—*Radiation Res.* **8,** 254-264. [Authors' summary modified.] **2637**

When mice are exposed for the duration of life to daily doses of γ-rays ranging from 6 r/day to 410 r/day, the extremities become progressively darkened. With doses ranging from 6 r per day to 170 r/day the amount of pigmentation appears to be a function of both radiation intensity and total accumulated radiation dose. Shielding experiments demonstrate that excessive pigmentation results from a direct action of X- and γ-radiation, and is due to an increased amount of epidermal melanin associated with increased melanogenic activity of melanocytes in the basal layer of the epidermis. Greying of the pelage, indicative of a loss of follicular melanocytes, also occurs in daily-irradiated mice that have hyperpigmentation of the extremities. The bearing of these observations on general problems of pigment cell dynamics is discussed.

FEDOROFF, S. & ALTSCHUL, R. (1958). **Differences in nitrogen content in extracts of chilled and non-chilled tissues.**—*Canad. J. Biochem. Physiol.* **36,** 45-49. **2638**

Previous studies indicated that tissue cultures propagated more rapidly in media containing extracts from embryos that had been chilled for 7 days at 4°C. before extraction than in those in which the extract was made from fresh embryos. In an effort to determine the cause of increase in growth promotion, determinations of nitrogen content were made on fresh chilled chick embryo and human placenta and extracts prepared from each. Results indicated no difference in dry weight, nitrogen content, phosphorus content or nitrogen:phosphorus ratio between the chilled and fresh chick embryos and chilled and fresh human placenta. However, a significant increase of nitrogen content was demonstrated in the extracts prepared from both types of embryonic tissue. It is suggested that the chilling of tissues may increase the fragility of the cells so that subsequent extraction may release active substances from inert complexes and thus supply a better yield of nutritive substances.

——R. V. L. WALKER.

CROSS, B. A. (1957). **Physiological foundations of milk production and lactational disorders.** —*Vet. Rec.* **69,** No. 49. Pt. 2. pp. 1216-1223. Discussion: pp. 1223-1226. **2639**

The main factors controlling the rate of milk formation are discussed. The number of secretory cells in a mammary gland which is

determined by hormonal, genetic, and nutritional factors along with the rate of secretion by the alveolar cells determines milk output. This is influenced by the pituitary, thyroid, adrenal cortex, parathyroid and the pancreas and the supply of milk precursors, whilst the milk ejection reflex which is initiated by suckling or milking causing the release of oxytocin, is important in maintaining milk secretion. Milking performance is controlled by efficient milk withdrawal and a normal milk ejection. The individual milking characteristics of cows result from differences in the pattern of milk ejection. Management is responsible for double ejection and emotional inhibition of milk ejection. Pituitary growth hormone therapy appears effective in inducing and enhancing lactation and lacks the undesirable features of treatment with oestrogens or thyroactive agents. Various lactational disorders of farm livestock are considered from the standpoint of pathological physiology.—A. Ackroyd.

Whittlestone, W. G. (1957). **The control of milk ejection in the mammal.**—*N. Z. vet. J.* **5,** 55-60. **2640**

W. outlined present conceptions on the mechanism of milk ejection and its connexion with the reproductive system and the regulation of the water balance. The possible role of the posterior pituitary hormones in regulating the secretions of the anterior pituitary lobe is discussed. Mechanisms not yet understood are the relay of nervous impulses, caused by the sucking stimulus, to the hypothalamus, and the storage and release of the neurohypophyseal secretions.—M.G.G.

Collery, L. & Keating, J. (1958). **Blood volume determinations in horses using radioactive phosphorus.**—*Vet. Rec.* **70,** 216-218. [Authors' summary modified.] **2641**

The blood and erythrocyte volumes of 10 horses, a donkey, and a jennet were measured by the radioactive phosphorus technique of Reeve & Veall. The mean blood volume was 6·9 ml. per 100 g. body wt. The mean erythrocyte volume was 2·6 ml. per 100 g. body wt.

Dodson, L. F. & Mackaness, G. B. (1957). **The estimation of basal blood pressure in the rat by tail oscilloscope.**—*Brit. J. exp. Path.* **38,** 618-627. [Survey of paper, p. i. modified.] **2642**

The measurement of the basal blood pressure in unanaesthetized rats by tail oscilloscope is described, and the factors which influence the figures obtained are discussed. The figures agreed closely with direct measurements of the carotid artery blood pressure.

Depelchin, A. (1957). Hématologie animale. III. L'hémogramme normal des espèces bovine et canine. **[Animal haematology. III. Normal blood picture in cattle and dogs.]**—*Ann. Méd. vét.* **101,** 340-370. **2643**

A detailed account of the cytology of peripheral blood of cattle and dogs. D. described binucleated cells in cattle, intermediate in size and morphology between lymphocytes and monocytes.—R.M.

Sturkie, P. D. & Textor, K. (1958). **Sedimentation rate of erythrocytes in chickens as influenced by method and sex.**—*Poult. Sci.* **37,** 60-63. [Authors' summary modified.] **2644**

Sedimentation rates of the r.b.c. of 15 cocks, 15 capons and 37 hens were determined in Wintrobe tubes held at an angle of 45°. Samples of hen blood were also held vertically. The rate was highest in hens, intermediate in capons and lowest in cocks. It was linear with time, from 10 to 120 min., and regression equations were calculated. The sedimentation rate of hen blood held vertically was only 16% that of blood held at 45°.

Bangham, A. D. & Lehmann, H. (1958). **'Multiple' haemoglobins in the horse.** — *Nature, Lond.* **181,** 267-268. **2645**

Haemoglobin from 65 horses was examined. Two fractions were present in all, indicating the presence of multiple haemoglobins rather than that of two allelomorphs as in cattle and sheep. It seems that mules and jennets do not inherit one but both these haemoglobins, another indication that the haemoglobins are not allelomorphs.—D. Poynter.

Mialhe, P. (1958). Glucagon, insuline et regulation endocrine de la glycémie chez le canard. **[Glucagon and insulin in relation to the endocrine control of glycaemia in ducks.]**—*Acta endocr., Copenhagen* Suppl. No. 36, pp. 134. [In French.] **2646**

The effects of total and partial pancreatectomy led M. to conclude that insulin and glucagon were indispensable for the maintenance of normal glycaemia in domestic ducks.—R.M.

Titchen, D. A. (1958). **Reflex stimulation and inhibition of reticulum contractions in the ruminant stomach.**—*J. Physiol.* **141,** 1-21. [Author's summary modified.] **2647**

Reflex reticulum contractions have been

evoked in decerebrate sheep, goats and calves by electrical stimulation of vagal afferent nerve fibres and by alterations in conditions in the stomach. The contractions ceased after the administration of atropine and were absent in preparations in which the dorsal abdominal vagus nerve had been cut.

The contractions were stimulated by stretching the reticulum or distension of a balloon in the omasal canal; reduction in the pH in the abomasum to 0·9-1·0; touching the lower part of the thoracic oesophagus or the abomasal mucosal surface; or stretching the abomasum after section of the splanchnic nerves.

The reflex contractions were inhibited by distension of the abomasum when the splanchnic nerves remained intact, by manipulation of the pylorus and by stimulation of the central end of a splanchnic nerve. Both excitatory and inhibitory effects of adrenaline on the reticulum contractions were observed.

McLean, F. C. (1958). **The ultrastructure and function of bone.**—*Science* **127,** 451-456. **2648**

M. discussed the ultrastructure of bone and postulated a dual mechanism for the homeostatic control of blood calcium, as follows: (i) The parathyroid glands are responsible for monitoring the calcium ion concentration in the blood plasma. They respond, rather slowly, to changes in the calcium ion concentration in the internal environment, and by regulating the dissolution of stable bone mineral they serve to maintain a relatively constant level of calcium ions in the blood. (ii) What we may call the fine adjustment of the calcium ion concentration in the blood, i.e., the minute-to-minute control, is effected by rapid transfers, in both directions, between the blood and the labile fraction of the bone mineral. Whether this is a purely passive chemical affair, by diffusion equilibrium, or whether it is also mediated by the parathyroid hormone (as well as by vitamin D) remains uncertain.—R.M.

Groth, W. (1957). Beziehungen zwischen Schilddrüse und Nebenniere im Wärmehaushalt. **[Relationship between thyroid and adrenal glands in temperature regulation.]**—*Arch. exp. VetMed.* **11,** 22-29. **2649**

In rats exposed to cold (+3° to +6°C.) i/m injection of adrenal cortical extract checked the rise in activity of the thyroid gland and adrenal cortex. The fall in body weight was twice as great as in untreated rats exposed to cold. On the other hand, in rats kept at room temp. the injection of adrenal cortical extract tended to increase the activity of the thyroid while depressing that of the adrenal cortex. Growth was slower than in controls. Hypertrophy of the liver with increased glycogen content was found in treated rats kept at room temp. but not in treated rats exposed to cold. It is concluded that the adrenal cortical hormones, at the doses used in clinical practice, depress the activity of the thyroid gland only when this would be heightened during stress.

—M.G.G.

Santamarina, E. (1958). **Melanin pigmentation in bovine pineal gland and its possible correlation with gonadal function.**—*Canad. J. Biochem. Physiol.* **36,** 227-235. **2650**

Spectrophotometric analysis and chemical and cytochemical methods were used to demonstrate the presence of melanin (black pigmentation) in the bovine pineal gland. In cows and intact male cattle the increased incidence of pigmentation appeared to be an aging phenomenon in so far as in young male cattle and heifers under two years of age no melanin was found, but older animals in both groups tended to reveal melanin with gradual percentage increase up to and over five years of age. On the other hand, in castrated males between 18 and 24 months of age, there was macroscopic evidence of melanization in 49·6% of the pineal glands studied and in steers from some herds the incidence ranged as high as 67% in the glands. The fact that castration causes hypertrophy of the pineal gland followed by a degenerative process in which melanin is involved seems to give strong evidence of a pineal gonadal interrelationship.—R. V. L. Walker.

Poulik, M. D. & Smithies, O. (1958). **Comparison and combination of the starch-gel and filter-paper electrophoretic methods applied to human sera: two-dimensional electrophoresis.**—*Biochem. J.* **68,** 636-643. [Authors' summary.] **2651**

The results obtained by the electrophoresis of the proteins of normal and abnormal sera by the starch-gel and filter-paper methods are compared. The considerable increase in information given by the starch-gel method is apparent. The components demonstrated in the gels are correlated with those seen on filter paper, by the use of a suitable combination of the two methods. A two-dimensional electrophoretic system (the first dimension on filter paper, the second at right angles in starch-gel) is described in detail. More than 20 serum-protein components can be demonstrated with this system. A nomenclature suitable for describing the components demonstrated by the starch-gel method is proposed. Several of the

components have been identified with specific proteins previously isolated or described by other workers.

EADE, N. R. (1958). **The distribution of the catechol amines in homogenates of the bovine adrenal medulla.**—*J. Physiol.* **141,** 183-192. [Author's summary.] **2652**

The distribution of the three catechol amines, adrenaline, noradrenaline and dopamine, in sucrose homogenates of the bovine adrenal medulla has been studied. Centrifugation at high speed of suspensions of large granules in isotonic sucrose over strongly hypertonic sucrose yielded a sediment richer in noradrenaline and poorer in adrenaline than the large granules; conversely, a fraction richer in adrenaline and poorer in noradrenaline was retained in the upper portions of the centifuge tube. The dopamine present in the gland is distributed over the non-particulate material, the microsomes and the large granules very much as are adrenaline and noradrenaline, with most of the amine in the large granules.

WALTER, H. & MAHLER, H. R. (1958). **Biochemical studies of the developing avian embryo. I. Protein precursors in vivo.**—*J. biol. Chem.* **230,** 241-249. [Authors' summary modified.] **2653**

Radioactively labelled homologous and heterologous proteins, peptides, and amino-acids were injected into the yolks or whites of fertilized eggs. After 5-9 days of incubation the embryos were removed, dry protein powders were prepared from them, and the radioactivity was determined. It is concluded that during this period of incubation yolk protein is the preferred precursor of embryonic chick proteins and that the intermediary is probably an amino-acid derivative ("activated amino-acid"). Subcellular fractionation of the embryos indicated that the nuclear fraction is more active metabolically on the 5th day and the mitochondrial fraction more active on the 9th day of incubation.

WITH, T. K. (1958). **Preparation of crystalline porphyrin esters from bovine porphyria urine.**—*Biochem. J.* **68,** 717-720. [Author's summary modified.] **2654**

A method for large-scale preparation of uro- and copro-porphyrin I as crystalline esters from bovine porphyria urine is given. About 10% of the porphyrin present in the urine was recovered as crystalline esters.

Besides uro- and copro-porphyrin I a 6-carboxyl porphyrin was found to be constantly present in minor quantities in bovine urine from the case reported by Jørgensen & With [*V.B.* **26, 1044**].

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

BOOKER, D. V. (1957). **Radio-caesium in dried milk.**—*Physics in Med. and Biol.* **2,** 29-35. [Author's summary modified.] **2655**

A gamma scintillation spectrometer method for measuring radio-caesium and potassium content of dried milk was described. The changes with time of the ^{137}Cs activity in dried milk from Frome, Somerset and from 5 other areas of the U.K. were recorded.

ANDERSON, G. W., EPPS, N. A., SNYDER, E. S. & SLINGER, S. J. (1958). **Comparative effectiveness of feeding aureomycin and dipping in an aureomycin solution as a means of preserving poultry meat.**—*Poult. Sci.* **37,** 174-179. [Authors' summary modified.] **2656**

Fowl carcasses dipped in water containing 10 p.p.m. of chlortetracycline absorbed appreciable amounts of the antibiotic which exerted a bacteriostatic effect on micro-organisms present on the tissue. They had a slightly lower bacterial count and remained fresh longer than untreated carcasses. Feeding 1,000 or 2,000 g. of chlortetracycline per ton for 5 days before slaughter prolonged the keeping time of the meat, although on the basis of bacterial counts and the appearance and odour, the concentration of 2,000 g. was not superior to that of 1,000 g. Combination of feeding and dipping was not distinctly superior to either treatment used singly. Residual chlortetracycline was destroyed by cooking.

SILVESTRINI, D. A., ANDERSON, G. W. & SNYDER, E. S. (1958). **Chlortetracycline as related to the microbiology and preservation of poultry meat.**—*Poult. Sci.* **37,** 179-185. [Authors' summary modified.] **2657**

Dipping fowl carcasses into a soln. containing 10 p.p.m. of chlortetracycline delayed the onset of bacterial spoilage for about 25 days. Feeding 1,000 g. of chlortetracycline per ton for 3 days, 2 days or 1 day before slaughter delayed the onset of spoilage for about 18, 14 and 11 days, respectively. 500 g. of chlortetracycline per ton of drinking water for 1 day before slaughter prolonged keeping quality for about 11 days. The route of bacterial spoilage in poultry meat appears to start in the visceral cavity tissue and spreads through the muscle

tissue to the skin. The production of NH_3-N from the degradation of tissue protein, the increase in bacterial populations and the degree of fluorescence were closely associated with the detection of spoilage by the appearance and odour.

See also abst. 2413 (brucellosis in veterinary personnel).

REPRODUCTION AND REPRODUCTIVE DISORDERS

STOWER, J. & BUD-HUSAIM, P. (1957). **Conception rates with bull semen diluted in a glycerolized glycine-egg yolk-fructose buffer.** —*J. agric. Sci.* **49**, 220-222. **2658**

The preparation of a semen diluent containing egg yolk, glycine, sodium citrate, fructose and glycerol is described. In 2005 inseminations with semen from 21 bulls, stored in this diluent at 4°C. for 24-196 hours, the conception rate was 65·7%. In a second trial, using semen from 2 bulls, the conception rates were 75·3% for 401 inseminations with semen stored for 24-48 hours, and 60% for 398 inseminations with semen stored for 96-144 hours.—M.G.G.

BOUCHER, J. H., FOOTE, R. H. & KIRK, R. W. (1958). **The evaluation of semen quality in the dog and the effects of frequency of ejaculation upon semen quality, libido, and depletion of sperm reserves.**—*Cornell Vet.* **48**, 67-86. **2659**

Previous reports on the quantitative aspects of semen production gave conflicting results. 125 ejaculates from 25 dogs were used to compare collection methods. Hand manipulation in conjunction with the use of a teaser, oestrous bitch gave decidedly superior semen samples. Optical density (by colorimeter) was very closely correlated with spermatozoa concentration.

248 ejaculates from 8 Beagles were studied as to effect of frequency of collection on yield. A decrease in spermatozoa output resulted from collecting more frequently than every second day. Reserves thus depleted were restored in 2–3 days. [The subjects were caged indoors throughout.]—F. L. M. DAWSON.

WATANABE, M. (1957). **An improved technique of the artificial insemination in ducks.**—*J. Fac. Fish. Anim. Husb., Hiroshima Univ.* **1**, 363-371. [Author's summary modified.] **2660**

Drake semen was collected readily by intermittent application of 30 volts at 0·06–0·08 amperes A.C. The method was superior to massage, where the psychological response of the bird is a prevailing factor. Ducks were inseminated by means of a special speculum and a glass pipette. No difference in the fertility of the semen was found between electrical stimulation and massage; with both methods fertility was about 85%.

GRAY, J. (1958). **The movement of the spermatozoa of the bull.**—*J. exp. Biol.* **35**, 96-108. **2661**

Movements of the flagellum of bull spermatozoa were studied by multiple flash microphotography under dark-ground illumination. The distal part of the flagellum executed a figure-of-eight movement. Movements of the spermatozoon about its median longitudinal axis, and velocity of spermatozoa, were also studied.—R.M.

BRATTON, R. W., FLOOD, J. C., FOOTE, R. H., WEARDEN, S. & DUNN, H. O. (1957). **Fertility of bovine spermatozoa stored at minus 79° C. for one week and for seventeen weeks.** —*J. Dairy Sci.* **40**, 154-162. **2662**

Seventy-five ejaculates from 8 bulls were each divided into 3 portions, one being used for insemination on the day after collection, the second after storage at -79°C. for 1 week, and the third after storage at -79°C. for 17 weeks. The conception rates were 71% for 1,278 inseminations with unfrozen semen, 73·2% for 1,151 with semen frozen for 1 week, and 69·8% for 1,094 inseminations with semen frozen for 17 weeks. The average survival rates of spermatozoa were 77% after 1 week and 62% after 17 weeks at -79°C. The dry-ice equipment used for carrying the frozen semen is described.—M.G.G.

SALISBURY, G. W. & VANDEMARK, N. L. (1957). **Carbon dioxide as a reversible inhibitor of spermatozoan metabolism.** — *Nature, Lond.* **180**, 989-990. **2663**

Though there was some variation between samples, an atmosphere of 100% CO_2 at 37°C. reduced glycolysis (as measured by CO_2 production) to about 10% of that in pure nitrogen atmosphere, and after 4 hours, substitution of a 95/5 N_2/CO_2 mixture restored initial glycolysis rate. 50% of the total cells still showed vigorous motility 4 hours after reversal of the inhibition. Practical application in artificial insemination is envisaged.—F. L. M. DAWSON.

DAWSON, R. M. C. (1958). **The labelling of ram semen *in vivo* with radioactive phosphate and [*carboxy*-^{14}C]stearic acid.**—*Biochem. J.* **68**, 512-519. [Author's summary modified.] **2664**

Rams were injected i/v with [^{32}P]phosphate and [*carboxy*-^{14}C]stearic acid, and the appearance of labelled phosphorus compounds and fatty acids in the seminal plasma and spermatozoa was studied. The maximum ^{32}P-labelling of seminal glycerylphosphorylcholine occurred some 15–18 days after injection, followed by the spermatozoal phospholipids, acid-soluble phosphorus and a fraction designated residual phosphorus, all having maxima at about 21–26 days. The spermatozoal deoxyribonucleic acid appeared in a labelled form much later, reaching a maximum at 50–52 days. In one animal ejaculating non-motile spermatozoa the appearance of labelled glycerylphosphorylcholine in the semen was considerably delayed compared with normal rams. In a ram in which the connexions between the epididymides and testes were severed surgically the seminal-plasma glycerylphosphorylcholine and spermatozoal acid-soluble phosphorus became labelled with ^{32}P, but no appreciable activity appeared in the phospholipids, residual phosphorus and deoxyribonucleic acids of the spermatozoa. An assessment was made of the minimum time taken for spermatozoa to pass through the epididymides and for spermatocytes to be converted into spermatozoa.

KRISHNA RAO, C. (1958). **Development of motility in the spermatozoa of farm animals.**—*Indian vet. J.* **35**, 97-104. **2665**

Observations on spermatozoa collected from different levels of the male reproductive tract of some mammalian and avian species showed that the accessory gland secretions were not necessary for initiating motility, and it was concluded that they merely facilitated its expression by lowering viscosity and spermatozoa concentration. The avian testicular spermatozoon was found to be more actively motile than the mammalian testicular spermatozoon.—R. N. MOHAN.

AVERILL, R. L. W. & ROWSON, L. E. A. (1958). **Ovum transfer in the sheep.**—*J. Endocrin.* **16**, 326-336. [Authors' summary modified.] **2666**

127 fertilized sheep ova were transferred to 91 ewes in which oestrus had been detected 1-4½ days previously. 52 ewes received ova of the 6- to 16-cell stage, and 41 of these (78·8%) lambed. Transfers were most successful when oestrus was synchronized between donor and recipient. Some ova were successfully transferred after storage *in vitro* at between 30° and 37°C. for up to 115 min. Ova at the 6- to 16-cell stage developed more frequently in ewes which had more than one corpus luteum in their ovaries at the time of transfer; of ova transferred singly 74%, and of ova transferred in pairs 75% developed into lambs. No 2-cell ova, and only 15·8% of 4-cell ova developed when transferred into the uterine cornua, and no 2- or 4-cell ova developed when transferred into the uterine tubes of ewes in which oestrus had begun more than 3 days previously. Successful transfers were not significantly related to breed, season, or to the number and result of previous transfers in the recipient. Of 13 ewes in which transfers failed, 12 later conceived after mating at their first or second heat in the season of transfer.

I. ZACHARIAE, F. (1958). **Studies on the mechanism of ovulation. Permeability of the blood-liquor barrier.**—*Acta endocr., Copenhagen* **27**, 339-342. **2667**

II. ZACHARIAE, F. & JENSEN, C. E. (1958). **Studies on the mechanism of ovulation. Histochemical and physico-chemical investigations on bovine follicular fluids.**—*Ibid.* 343-355. **2668**

III. JENSEN, C. E. & ZACHARIAE, F. (1958). **Studies on the mechanism of ovulation. Isolation and properties of acid mucopolysaccharides in bovine follicular fluid.**—*Ibid.* 356-368. [In English. Authors' summaries modified.] **2669**

I. Using intravenously injected Evans blue as indicator, the author found a pre-ovulatory increase in the permeability of the barrier between blood and follicular fluid.

II. Follicular fluid stained metachromatically with toluidine blue. The intensity of this metachromasia decreased in the preovulatory phase. Fluid in the pre-ovulatory follicle contained a substance capable of depolymerizing mucopolysaccharides. Factors affecting the viscosity of human and bovine follicular fluid were studied. It was concluded that the increase in colloid-osmotic pressure resulting from the enzymic degradation of mucopolysaccharides in follicular fluid played an important role in ovulation.

III. Chondroitin sulphuric acid and hyaluronic acid were isolated from bovine Graafian follicles. In small follicles both substances were present in roughly equal amount, but chondroitin sulphuric acid predominated in large follicles. Small follicles contained about 0·3% and large follicles about 0·2% mucopolysaccharides. The molecular weights of these polysaccharides decreased during maturation of follicles. A follicle just about to rupture contained a thermolabile non-dialysable substance capable of degrading the isolated acid mucopolysaccharides.

ADAMS, C. E. (1958). **Egg development in the rabbit: the influence of post-coital ligation of the uterine tube and of ovariectomy.**—*J. Endocrin.* **16**, 283-293. **2670**

The earlier report of Pincus & Kirsch [1936] that rabbit eggs fail to develop beyond the early blastocyst stage in the ligated uterine tube has been amply confirmed in the present experiments. A high proportion of the blastocysts were recovered in a characteristic shrunken condition in which the zona pellucida appeared contorted and irregular.

In bilaterally ovariectomized does the eggs also failed to develop beyond the early blastocyst stage, although in the majority of these does the eggs entered the uterus within the normal time interval. Histological examination of the uterus showed that the endometrium possessed an almost infantile appearance associated with the lack of ovarian hormones. Treatment of ovariectomized does with progesterone confirmed that blastocyst expansion could continue normally at least to implantation, the most advanced stage examined. [See also *V.B.* **26**, 3030.]—R.M.

METCALF, J., HUCKABEE, W. E., PRYSTOWSKY, H., HELLEGERS, A., MESCHIA, G., WOLKOFF, S. & BARRON, D. H. (1958). **Uterine blood flow in unanesthetized pregnant sheep.**—*Fed. Proc.* **17**, 111. **2671**

Determinations of uterine blood flow in unanaesthetized ewes agreed with those obtained previously in anaesthetized goats. The flow increased with advancing pregnancy and exceeded 1 litre/min. at term.—R.M.

BASSETT, E. G. (1958). **Gestational changes in connective tissue in the ewe.**—*Nature, Lond.* **181**, 196-197. **2672**

Samples of broad and sacrosciatic ligament from 9 control and 29 pregnant ewes were studied by silver impregnation and other methods. Other pelvic tissues were sampled also in 13 of the ewes. The main gestational effect seen was an intense activity of the fibroblast cells. A differential sensitivity of fibroblasts to pregnancy hormones is suggested. Histochemical methods are to be applied.—F. L. M. DAWSON.

CROSS, B. A. (1958). **On the mechanism of labour in the rabbit.**—*J. Endocrin.* **16**, 261-276. [Author's summary modified.] **2673**

Labour was induced in full-term does under pentobarbital sodium anaesthesia by injection of 50-200 m.u. oxytocin or by electrical stimulation of the supraoptico-hypophyseal tract. Abdominal contractions, milk ejection and delivery of the young were recorded kymographically. Young were born at rates varying from twelve in 7 min. to three in 20 min. They began to suck while the doe was still in labour. The delivery of each pup was assisted by reflex straining movements of the doe. Though commonly labour was completed without the secretion of additional oxytocin from the neurohypophysis (as shown by the milk-ejection record), occasionally a reflex release did occur in amounts sufficient to influence labour. In many cases labour appeared to be as efficient as in the conscious animal. Suppression of abdominal contractions by spinal anaesthesia did not prevent delivery of young after the injection of oxytocin. However, the time taken to expel individual young from the vagina tended to increase, and the last one was generally retained in the vagina. The physiological mechanisms of parturition in the rabbit are discussed in the light of these and earlier findings.

NICANDER, L. (1958). **Studies on the regional histology and cytochemistry of the ductus epididymidis in stallions, rams and bulls.**—*Acta morph. neerl.-scand.* **1**, 337-362. [In English.] **2674**

The ductus epididymidis of the species examined could be divided into 6 regions on the basis of height, structure and cytochemistry of the epithelium. The function of each region was discussed.—R.M.

VELLE, W. (1958). **On the chromatographic isolation of two different Kober chromogens from pregnant cow's urine, with some remarks on analytical procedure.** — *Acta endocr., Copenhagen* **27**, 64-72. [In English. Author's summary modified.] **2675**

The two main oestrogens in pregnant cow's urine were oestrone and oestradiol-17α. In the 9th month of pregnancy these hormones were found in amounts of 0·1–0·15 mg./litre and 0·15–0·2 mg./l. respectively.

WRENN, T. R. & SYKES, J. F. (1957). **Effects of feeding stilbestrol to lactating dairy cows.** —*J. Dairy Sci.* **40**, 1581-1584. [Authors' summary modified.] **2676**

No effect on milk production was observed in 11 cows fed 10-15 mg. of stilboestrol daily for 60 days.

LOTZ, W. E. & COMAR, C. L. (1958). **Influence of alpha estradiol on skeletal tissue and radiocalcium metabolism of castrated male lambs.** —*Fed. Proc.* **17**, 100. [Authors' abst. modified.] **2677**

Daily administration of 0·1–2·5 mg. of alphaoestradiol to 26 castrate lambs for 37–171 days resulted in an increased amount of medullary bone in the femur. The increase was proportional to the dose of the oestrogen and to the length of administration and apparently resulted from (1) an increased amount of bone of endosteal origin lining the shaft of the femur and (2) an increase in bone of endochondral origin in the femur metaphysis. Autoradiograms failed to show a difference in the amount of *in vivo* or *in vitro* uptake of radiocalcium between the bones of control and oestrogen treated animals. This led to the conclusion that an increase in the rate of calcification could not have accounted for the increased formation of the medullary bone. Additional support for this conclusion was found in a lack of difference between the rates of disappearance of radiocalcium from the blood of control and oestrogen treated lambs.

WRIGHT, J. F. & SEIBOLD, H. R. (1958). **Estrogen contamination of pelleted feed for laboratory animals — effect on guinea pig reproduction.**—*J. Amer. vet. med. Ass.* **132,** 258-261. **2678**

A g.pig colony was fed unintentionally on pellets that had been processed in a mill previously used for preparing a poultry mash supplemented with oestrogens. Reproductive disturbances followed, decreasing the number of expected litters, in a given period, from 861 to 158. The infertility was progressive and apparently irreversible. Histological examination of uteri revealed an extreme glandular hyperplasia and, in the more severe cases, areas of squamous metaplasia.—M.G.G.

DIESEM, C. D., BLETNER, J. K. & VENZKE, W. G. (1958). **The effect of estradiolcyclopentylproprionate (ECP) on the blood cells of chickens.** — *Avian Diseases* **2,** 63-75. [Authors' summary modified.] **2679**

The injection of a synthetic oestrogen, ECP, produced no detectable clinical signs of toxicity in 16 chickens (8½ weeks old). The hormone was used to study its effect on avian haemograms, blood clotting and haemopoietic activity.

Administration of the ECP in dosage as high as 12 mg. failed to cause thrombocytopenia or produce haemorrhage. The chickens receiving the hormone continued to appear clinically healthy. Chickens receiving 0·1% sulphaquinoxaline in their ration did not show any different effects from ECP than those that were on a 22% protein broiler ration. The gonads of the male and female 9½-week-old chickens did not show any effects from the administration of ECP but the mucosa of the oviduct and the albumin-secreting glands that occur in the submucosa were stimulated. No gross changes were found in the bone marrow of ECP injected chickens.

VAN TIENHOVEN, A. (1957). **A method of "controlling sex" by dipping of eggs in hormone solutions.**—*Poult. Sci.* **36,** 628-632. **2680**

Eggs were dipped, before incubation, for 5 sec. into an oil emulsion containing 5 mg. diethylstilboestrol per 100 ml. In day-old males hatched from these eggs the left gonad was macroscopically and histologically indistinguishable from a normal ovary. With age, however, the cortex became smaller and seminiferous tubules developed. In 32 out of 37 hens hatched from eggs treated in this fashion the left oviduct was too small to permit egg production. Birds hatched from eggs dipped in 95% ethanol containing 650 mg. testosterone propionate per 100 ml. were normal.—M.G.G.

NISHIKAWA, Y., HIROE, K., SUGIE, T. & YAMAMOTO, I. (1956). **[Prevention of abortion in mares by oestrogen treatment: experimental results and mechanism of prevention.]**—*Bull. Nat. Inst. agric. Sci., Japan* Ser. G. No. 12. pp. 243-248. [In Japanese. Summary in English.] **2681**

Four pellets of 20 mg. each of stilboestrol were implanted i/m at intervals of 13 days into 131 mares in the 2nd-6th month of pregnancy. For 75 of these mares records were available and about half of these had previously aborted. Abortions after treatment amounted to 4%. Of 576 mares 60% had records of abortions, but only 3·3% aborted after treatment.—E.G.

NEWSAM, I. D. B. (1957). **Studies on abortion in farm livestock with special reference to cattle.**—*Thesis, Cambridge* pp. 1-124. **2682**

Of cultures from 1,573 foetuses over 7 years about 15% yielded recognized abortifacient pathogens, 30% were bacteriologically sterile and the remainder massively contaminated. N. therefore considered that the methods used were inadequate to reveal some hitherto undetected infectious agent; especially as outbreaks of abortion, involving 10–15% of all cattle in each of 26 herds, investigated in more detail, yielded no recognized abortifacient organisms, yet were characterized by a distinctive necrosis of the placental cotyledons. N. succeeded in removing a foetus and membranes in process of expulsion from a cow involved in one herd and attempted a well-organized transmission experiment on 11 heifers, none of which, however, aborted.

The examination of vaginal smears yielded fresh information on the cytology, but no monocytosis to suggest the presence of an obscure infection. Neither did suspect infective material inoculated into mice, developing chick membrane and bovine tissue culture. [N. states there is no *prima facie* evidence that faulty nutrition or hormonal imbalance plays any major part in the bovine abortion problem. But see, for example, McDonald *et al.* (*V.B.* **24,** 2958); Dawson, 1958: *Agric. Rev.* **3,** 20-28 (p.21).]
—F. L. M. Dawson.

Richter, K. (1957/58). Über Ursachen der zunehmenden Sterilität beim Rind und Möglichkeiten ihrer Bekämpfung. **[Causes of increased incidence of sterility among cattle and possibilities of control.]**—*Prakt. Tierarzt.* No. 12. (1957) pp. 351-354 & 357; No. 1. (1958) pp. 4-6, 8 & 10. **2683**

Irrespective of milk yield, but as a result of injudicious feedstuff selection, mineral deficiency increasingly produces impairment of a normal oestrous cycle, including cystic ovaries as often as not. R. believed that injection of the deficient minerals could not be effective until there was some clinical improvement; clin. improvement was thought to result from treatment with vitamins E, A and D, and a phosphogluconate preparation, 150 ml. containing 1·45 g. elemental phosphorus. Assuming 50% absorption, this dosage should raise the body content of the element by 10%. Methionine should be given in addition, where there were indications of liver damage (assumed to be present in aggravated cystic disease or cases of small indurated ovaries). R. claimed that 80% of cases afterwards became pregnant whether treated in summer (200 cases) or winter [but no controls appear to have been kept, and the number of winter-treated cases was not given.] A trial of cyst-rupture accompanying the phosphogluconate gave less favourable results. [Richter's conclusions on the value of cyst rupture and vitamin E therapy are in direct opposition to the available controlled experimental results on these aspects. The recognized importance of the hereditary factory in the aetiology of cystic ovarian disease receives little consideration.]
—F. L. M. Dawson.

Moller, K. (1958). **Effect of calciferol injections on bovine fertility.**—*N. Z. vet. J.* **6,** 17-18. [Author's summary modified.] **2684**

Experiments to determine the effects of massive injections of calciferol into cows are described. Although the data were not statistically significant they indicated that such injections may have beneficial effects on infertility.

Blunt, M. H. & Kyle, M. G. (1958). **The effects of using intra-cervical stainless steel springs in 65 Aberdeen Angus cows.**—*N. Z. vet. J.* **6,** 19-20. [Authors' summary modified.] **2685**

Intracervical stainless steel springs inserted into the cervix uteri as described by Roy & Rowson (1954) [*Vet. Rec.* **67,** 177] were used to induce sterility in 65 Aberdeen Angus cows. Thirteen cows became pregnant after the insertion of the clips. Twenty-six cows were examined P.M.; of these, 13 had the clips wholly in the cervical canal. Five of these 13 were pregnant.

Mann, T. R. R. (1957). **Research problems in animal reproduction.**—*Vet. Rec.* **69,** No. 49. Pt. 2. pp. 1183-1189. **2686**

Three main topics were selected. The diagnosis of sex of offspring early in pregnancy, by study of sex chromatin in cells from the amniotic fluid, is a promising field. Progress in sex ratio differentiation and control has been slight.

Regarding the role of hormones in reproduction, the chemical analysis of semen and accessory secretions as hormone indicator tests, is expected to become increasingly important. Knowledge increases rapidly of biochemistry in health and in disease, and interrelationships of androgens, oestrogens and progestogens, but the gonadotrophins have not been properly purified or identified.

There is a great revival of interest in the effect of mineral nutrition on reproduction. M. is impressed by the evidence that the specific deficiency may often be of an amino-acid or protein incorporating the mineral, and hence the irrelevance of investigation techniques involving reduction to ash.—F. L. M. Dawson.

Greenwood, A. W. (1958). **Deoxyribonucleic acid and genetic modification in ducks.**—*Nature, Lond.* **181,** 533. **2687**

G. discussed the work of Benoit *et al.* [*C.R. Acad. Sci. Paris* **244,** 2320 & **245,** 448 (1957)], who observed changes in the colour of the bill of Pekin ducklings of both sexes after weekly injections of deoxyribonucleic acid derived from blood and testicles of Khaki Campbell drakes. When the treated males and females matured, they were mated and of 26 ducklings hatched from the females' eggs 73% had atypically coloured bills. G. concluded that repetition and extension of this work was required before it could be proved that genetic modification had been induced by the treatment.—R.M.

Björk, G., Dyrendahl, S. & Olsson, S. E. (1957). **Hereditary ataxia in smooth-haired fox terriers.**—*Vet. Rec.* **69,** 871-876. **2688**

Affected dogs were normal when born and first developed mild signs of ataxia when about 4 months old. One of the characteristic features was difficulty in climbing up or down stairs or on to a chair. The condition was never fatal. Examination of the pedigrees of 25 affected dogs revealed that it was probably due to a recessive, monogenic, autosomal gene. Pathological examination of 5 cases failed to reveal the cause of ataxia.—R.M.

Biely, J. & March, B. E. (1958). **Strain differences in susceptibility of chickens to renal disorders.** — *Poult. Sci.* **37,** 99-102. [Authors' summary modified.] **2689**

The incidence of mortality from renal disorders was studied in 4893 White Leghorns. There were significant differences between strains. A high level of nutrition increased the incidence of renal disorders in a susceptible strain, but not in a less susceptible strain.

Teige, J. (1957). **Congenital malformations of the Müllerian ducts and sinus urogenitalis in pigs.** — *Nord. VetMed.* **9,** 609-629. [In English. Summaries in German and Danish.] **2690**

Genital organs from 9,250 gilts and 476 sows from 2 Danish abattoirs were examined but the post-cervical levels of the tract were available in only 2,142 and 111 subjects respectively. Müllerian and urogenital sinus abnormalities occurred in 3·24%. Failure to breed accounts for 3–5% of the discard of sows in Norway and Sweden. This suggests that the abnormalities described play an appreciable part in causation, *e.g.* vaginal aplasia and hydrosalpinx (collectively 0·2% of material) though some forms do not interfere with reproduction. Extension of artifical insemination may emphasize the economic importance.

—F. L. M. Dawson.

Überreiter, O. (1957). Membrana pupillaris corneae adhaerens persistens beim Hunde. **[Adherence of the pupillary membrane to the cornea in dogs.]**—*Dtsch. tierärztl. Wschr.* **64,** 507-509. **2691**

Eight cases of this congenital affection are described; in 5 dogs it was unilateral, in 3 bilateral.—M.G.G.

See also absts. **2412-2422** (brucellosis); **2436-2437** (bovine vibriosis); **2459** (toxoplasmosis from ovine cotyledons); **2606** (pregnancy disease in ewes); **2706** (manual of microbiological methods); **2708** (symposium on trichomonad vaginitis).

ZOOTECHNY

Lang, W. R. (1958). **The colour of wool.**—*J. Aust. Inst. agric. Sci.* **24,** 53-55. **2692**

Experimental results on the effect of various types of light on bacterial and canary stains and golden coloration of wool, the measurement and visual discrimination of "off white" colour of greasy or scoured wool, the estimation of dust content by the degree of penetration along the staple, and the effect on colour of dipping in copper sulphate solution are briefly reported.

—S. S. Y. Young.

Badawy, A. M., Campbell, R. M., Cuthbertson, D. P. & Fell, B. F. (1957). **Changes in the intestinal mucosa of the sheep following death by humane killer.**—*Nature, Lond.* **180,** 756-757. **2693**

Comparison of the histology of the mucosa of the small intestine of sheep shot in the frontal region with a captive-bolt pistol and then bled, with specimens removed from sheep under pentobarbitone anaesthesia revealed an intact mucosa in the latter but pronounced shedding of epithelium, with loss of material from Brunner's glands, in sheep which had been shot. There were corresponding differences in the nitrogen content of the digesta. This finding was confirmed in rats.—R.M.

Harrington, G. (1958). **Determining the fatness of live pigs.**—*Agric. Rev., Lond.* **3,** 20-25. **2694**

H. discussed methods for determining the fatness of live pigs by measuring the thickness of back fat or by determining total body fat. Even if a more suitable indicator than antipyrene were found for the latter test, it would have limited application in practice. Methods for measuring back fat by ultrasonic waves or X-rays had potential value for the large-scale selection of breeding stock, but existing apparatus was cumbersome and complicated.

—R.M.

Brumby, P. J. (1958). **Monozygotic twins and dairy cattle improvement.** — *Anim. Breed. Abstr.* **26,** 1-12. [Author's conclusion modified.] **2695**

Experience in a number of countries indicates that monozygotic twins, though occurring infrequently, may be found in sufficient numbers to make their use in experimentation feasible. Diagnosis based on morphological characteristics presents no great difficulty in a collection programme. Extensive use of such twins has indicated their superiority over non-

twin animals for experimental work, but the higher wastage and considerable basic cost in some areas present difficulties. The limited value of experiments using small numbers of twin sets must be stressed because of possible error variation inherent in small groups and the marked variability in response to different treatments observed between twin pairs.

BOWLBY, G. M. S. (1957). **Some preliminary investigations into the effects of light on broilers.** — *World's Poult. Sci. J.* **13**, 214-216. **2696**

In fattening houses without windows the provision of red lighting eliminated feather-picking and cannibalism without greatly impairing feed intake. Fowls were nearly blind in blue light; this greatly facilitated catching the birds. B. obtained encouraging results from providing alternating periods of light and darkness, at one hour of light followed by 4 hours of darkness for up to 15 days, followed by 4 hours or 2 hours each of alternate light and dark.—R.M.

See also abst. 2713 (book, pig carcass evaluation).

TECHNIQUE AND APPARATUS

RECORD, B. R. & TAYLOR, R. (1958). **Freeze-drying equipment for large-scale laboratory use.**—*Biochem. J.* **68**, 420-430. [Authors' summary.] **2697**

Equipment is described for the routine freeze-drying of material on a large laboratory scale with the minimum of handling and attention. The evaporative spin-freeze principle is used throughout. Details are given of various special features of design, and of the methods used for the measurement of the temperature of drying material in rotating containers, and of the vacuum in low-pressure air-water-vapour systems. The practical advantages and disadvantages of this type of equipment are discussed and the performance is illustrated by a typical freeze-drying cycle.

MADIN, S. H., ANDRIESE, P. C. & DARBY, N. B. (1957). **The *in vitro* cultivation of tissues of domestic and laboratory animals.**—*Amer. J. vet. Res.* **18**, 932-941. **2698**

Attempts were made to cultivate various tissues from adult and embryonic animals in monolayers, using standard techniques. Culture of the following tissues succeeded in a high proportion of attempts: kidney from pig, ox, horse, g.pig, hamster, lamb, mouse, rabbit; pig and lamb testicle; pig lung; pig amnion. From embryos: pig, ox, hamster kidney. Embryonic brain, tongue, liver, cornea and adult bladder and ovary tissues were also cultivated in small numbers; and so were a pig sarcoma, horse sarcoid and mouse mammary adenocarcinoma. —R.M.

PRICE, E. K. & STRATTON, J. (1958). **An electronic stethoscope.**—*Brit. vet. J.* **114**, 72-74. **2699**

The authors described preliminary studies on animals with the electronic stethoscope described by Taylor & Fothergill [*Lancet* **1**, 1050. (1956)]. Amplification of heart sounds by the instrument facilitated auscultation of the heart in most species.—R.M.

WEBSTER, W. M. & CRESSWELL, E. (1957). **A new technique in indirect calorimetry.**—*Vet. Rec.* **69**, 526-527. **2700**

This article, except for some minor alterations, was published as a letter in *Nature* [see *V.B.* **28**, 1276]. Two photographs, however, appear here; one shows the spirometer attached to a sheep, and the other, an X-ray, shows the inflated balloon occluding the upper trachea. In addition, it is stated that 15 sheep have been tracheotomized so far, and no untoward effects have been observed for periods of up to 9 months during which recordings have been made almost daily.—M.G.G.

KNOX, R. & PENIKETT, E. J. K. (1958). **Influence of initial vacuum on steam sterilization of dressings.** — *Brit. med. J.* March 22nd, 680-682. [Authors' summary modified.] **2701**

A high vacuum system was used to remove air from an autoclave chamber before admitting steam. The time taken to reach a minimum sterilizing temp. of 115°C. inside a standard drum was about 1 min. when the pressure in the chamber, before admitting steam, was reduced to 20 mm. Hg (absolute) or below. With lesser degrees of vacuum the times taken for the temp. to reach 115°C. were variable and prolonged. It is suggested that, if rapid and predictable sterilization is required in an autoclave fitted with a pump for drawing a preliminary vacuum, the pump should be capable of reducing rapidly the pressure in the chamber to 20 mm. Hg (absolute) or below.

See also abstr. 2380 (diagnosis of mastitis); 2415 (brucella culture apparatus); 2429 (purification of leptospira cultures with membrane filters); 2450 (lab. diagnosis of contagious pleuropneumonia); 2508 (separation and identification of avian viruses); 2510-2511 (evaluation of disinfectants in chick embryos).

REPORTS

GREAT BRITAIN. (1957). **Report of the Medical Research Council for the years 1955-1956.** pp. 270. London: H. M. Stat. Off. 9s. **2702**

The main function of the Medical Research Council is to promote scientific investigations for the acquisition of knowledge likely to be of value for the prevention, diagnosis and treatment of disease. In addition the Council undertake special investigations required by Government Departments. The Council promote research in two ways: first they employ scientific staff of their own and secondly they make temporary grants for particular purposes to independent workers in universities, hospitals and elsewhere.

In Malaya important studies were carried out on animal infections and insect vectors, in an area where the prevalent filarial infection in man is due to *Wuchereria malayi*, transmitted by various species of Mansonioides. It was found that worms of the genus *Wuchereria* also occur in many of the animals of the region, especially in monkeys, dogs and cats. Their microfilariae are apparently indistinguishable from *W. malayi* found in man. Whether the adult worms found in animals are identical with those affecting man and whether these hosts constitute a true animal reservoir for the infection are questions requiring further investigation. This observation, however, complicates the determination of statistics concerning mosquito vectors of filarial worms.

In addition to the well known vector, *Aedes pseudo-scutelaris* (now renamed *Aed. polynesiensis*), two other species of mosquito, *Aed. fijiensis* and *Culex fatigans*, are now involved. This has made it much more difficult to recommend effective measures of vector control.

—D. S. RABAGLIATI.

COLONY AND PROTECTORATE OF KENYA. (1957). **Department of Veterinary Services Annual Report 1956.** [MACOWEN, K. D. S.] pp. 112. Nairobi: Govt. Print. Price. Sh. 5. **2703**

The year 1956 was good for the animal industry and the upward trend in general animal production continued. The Uplands Bacon factory showed an increase in the animals slaughtered of approximately 9·5%. There was a marked increase in the quantities of milk, butter and cheese handled by the Kenya Co-operative Creameries. This reflected the steady increase of dairy cattle.

The position of FOOT AND MOUTH DISEASE, the disease considered to be of greatest economic significance to the livestock industry, remained unchanged. Nearly 4,000,000 ml. of alum adsorbed Amsterdam foot and mouth disease vaccine was used, mainly in the European areas, but its high price precluded more extensive use. The Government accepted the principle that a high level of immunity must be obtained over the farming areas by the use of ample supplies of vaccine, produced as cheaply as possible within the country.

Compulsory vaccination against RINDERPEST was continued in the African areas during 1956 and a high degree of immunity was obtained; 1,342,377 doses of goat attenuated vaccine were issued.

Regarding the Veterinary Laboratory; serious losses of veterinary officers amongst the research staff occurred during the year, which greatly hampered the work and put a great strain on those left. The complement-fixation test for JOHNE'S DISEASE, based on that of Hole, was developed and used as a routine diagnostic procedure.

Following on the Kingdon report of 1949, the Kabete Laboratories discontinued the production of five more bacterial vaccines, Blackleg HAEMORRHAGIC SEPTICAEMIA, CONTAGIOUS ABORTION, ENTEROTOXAEMIA and PARATYPHOID, arrangements being made to purchase these in the United Kingdom. Owing to this decision, despite the loss of staff the Laboratories were able to undertake active research into INFECTIOUS BOVINE PETECHIAL FEVER ("ONDIRIITIS") which assumed epizootic proportions in districts hitherto unaffected.

LEPTOSPIROSIS was established to be the cause of death or severe jaundice, in cattle, sheep and pigs, notably in the Nanyuki district. The identity of the strain of leptospira involved is under investigation.

The combined diagnostic work covered the examination of 69,681 specimens, an increase of 8,209 over the previous year.

The Report contains sections on the zoological services including tsetse fly investigation and control, animal husbandry, artificial insemination, a list of publications and a list of legislation passed during the year.

—D. S. RABAGLIATI.

TRINIDAD AND TOBAGO. (1957). **Annual report of the Agriculture Department for 1955.** pp. 73. Trinidad: Govt. Printing Off. 75c. [Animal Health and Animal Husbandry pp. 32-45.] **2704**

Paralytic RABIES, bat-transmitted, totalled only 22 cases in 1955 against 270 in 1954. It must not be thought, however, that the situation will remain thus and that the incidence is

on the decline as the reduction in bats, observed during an outbreak in cattle, indicates that the disease in the vector bat is self-limiting and they may well increase again. Protective vaccination using the Flury strain of avianized modified live vaccine was continued. To control vaccination it was decided to place a whole-time veterinary officer, who will receive special training, in charge of the field and laboratory work. A part-time zoologist will also be available to carry out a study of the bat fauna.

For the third year in succession there was no case of SWINE FEVER. The presence of JOHNE'S DISEASE was established some years ago and sporadic cases still occur. A serological survey was instituted in departmental herds.

TUBERCULOSIS remains at a low incidence and of 3,291 cattle tested, the reactors reached 0·4%, but of 170 buffaloes tested 3·5% were reactors.

The veterinary diagnostic service was continued but the investigation work was limited owing to a shortage of staff. However, field trials of avianized modified live vaccine against RABIES in farm animals was continued. Feeding trials utilizing local foodstuffs were also carried out.

The animal husbandry section is under the veterinary staff and artificial insemination, after a cautious start, is now proving to be very popular.

Three stock farms were maintained during the year and the breeding of horses, cattle, buffaloes, donkeys, pigs, goats, sheep and poultry was controlled with a view to improving the breeds. Special attention was given to donkey breeding and increasing numbers of donkey mares were kept for breeding. The pigs kept were Large Black and Berkshires.

—D. S. RABAGLIATI.

NETHERLANDS. (1958). Mededelingen betreffende de Gezondheidsdienst voor Vee in Friesland. 38e jaarverslag, 1 Mei 1956 - 30 April 1957. **[Annual report of the Health Service for Livestock in Friesland (Netherlands) 1956-57.]** pp. 80. Leewarden: Gezondheidsdienst voor Vee. **2705**

[For the previous report see *V.B.* **27**, 3155.]

During the year only 21 tuberculous cattle were detected, 5 by tuberculin tests and the remainder by meat inspection (cattle population 420,000). They came from 15 of the 14,000 herds. The number of herds free from brucellosis increased by 10%; eradication by May 1959 was envisaged. It was advised that vaccination against brucellosis be confined to infected herds. The proportion of abortions caused by *Corynebact. pyogenes* was 4·57% (*i.e.*, 92 of 2,011 aborted foetuses received for examination). Up to 1954 this proportion seldom exceeded 3%, but following the intensive use of artificial insemination it increased to 5·13% in 1954/55 and 5·31% in 1955/56.

In a campaign for the control of Johne's disease 4,255 cattle in 98 herds were examined by the johnin test and 947 reacted. Blood from reactors was tested by the c.f. test and 229 of those positive were slaughtered: Johne's disease was present in 62 of 87 positive cattle including 56 of 72 born in or since 1950). In addition faeces samples and blood were examined from 1,022 clinically suspected cattle: the results are given.

The warble fly has been almost eradicated in Friesland; complete freedom from warbles will not be achieved while neighbouring territory is infested. Inoculation of all cattle with foot and mouth disease vaccine continued.

In an attempt to control liver fluke, ditches and the sides of ditches on 8 farms were treated in April/May with the molluscicide D.N.C. Two farms in the same district were untreated. 30 liver-fluke free lambs were placed on the fields in June. They were slaughtered in December. There was no reduction in the extent of liver fluke infestation in the lambs or in calves on treated farms.

Conditioned copper deficiency (diarrhoea, poor milk yield, poor condition) was common in central Friesland except where additional copper was administered in the food or distributed on pastures. Differentiation of the condition from Johne's disease presented difficulties.

—R.M.

BOOK REVIEWS

—. (1957). **Manual of microbiological methods. (By the Society of American Bacteriologists, Committee on Bacteriological Technic.)** pp. x + 315. New York (Toronto & London): McGraw-Hill Book Company, Inc. 41s. 6d. **2706**

This manual takes the place of the loose-leaf publication issued between 1923 and 1956 and collects much extremely useful information concerning pure culture study of bacteria and viruses. No attempt is made at standardization of methods, but details of various techniques that have been found by the committee to be satisfactory are clearly and concisely described.

The chapters dealing with staining procedures, preparation and use of culture media, study of anaerobes and routine tests for the identification of bacteria are well written and the directions given are concise and easy to follow. The manual also covers serological tests, detection of pathogenicity, urological techniques and methods for the study of bacteria causing plant diseases.

There is an excellent bibliography at the end of each chapter and a glossary of terms used, invaluable for both teacher and student.

—W. J. Brinley Morgan.

Vanbreuseghem, R. [translated by Wilkinson, J.] (1958). **Mycoses of man and animals.** pp. xi+235. London: Sir Isaac Pitman & Sons, Ltd. 50s. **2707**

The original section on the mycoses of man and animals which was attached by Professor Vanbreuseghem to the second edition of Langeron's Précis de Mycologie has been translated to form this book. There has never been any question of the usefulness of Langeron's Précis and the additional section brought together much interesting formation. It was however published in 1952 and so does not include any more recent references. Much of the earlier work in animals is also omitted and only six pages of the text are devoted specifically to the infections of animals together with some 43 references but without any illustrations. There is therefore only a restricted amount of useful information for workers in veterinary science and as no introductory mycology is included, the beginner will not find the book easy to understand. More than one third of the text is on the biology of the dermatophytes but there are virtually no details of ringworm in animals and mycologists will not find the classification of these fungi acceptable by present-day standards. Of considerable interest however are the author's views on immunity and allergy in ringworm and the account of his own work on the keratinolytic activities of these fungi. The translation has been carefully prepared and the book is well produced.—P. K. C. Austwick.

Netter, A. Edited by: Chappaz, G. (1957). Les infestations à trichomonas. Premier symposium européen. **[Trichomonad infections. Report of the first European symposium.]** pp. 381. Paris: Masson et Cie. Fr. 3000. **2708**

The vaginitis caused by *Trichomonas vaginalis* constitutes a major problem for gynaecologists throughout the world and this symposium organized by the Société Française de Gynécologie has attracted a large series of papers dealing with many aspects of the problem, including diagnostic methods and their efficiency, the biology of the parasite, epidemiology, pathogenesis, prophylaxis and chemotherapy.

In many ways the nature of *Tr. vaginalis* and the disease it causes are different from *Tr. foetus* in cattle. Nevertheless a small section on comparative pathology comprising four papers on trichomoniasis in cattle has been included. These papers are in the nature of reviews covering pathogenesis and clinical aspects, diagnosis, immunology and treatment.

—L. P. Joyner.

Anon. (1958). **Disease of domestic animals in New Zealand. (Prepared by Technical Committee, New Zealand Veterinary Association, Inc.)** pp. x+240. Wellington: Editorial Services Ltd. 35s. **2709**

This very pleasing small book deals with the "significant" diseases of domestic animals only as they occur in New Zealand.

Each disease or condition receives standardized treatment, the salient points being presented under fixed headings and in as few words as possible.

It is very up-to-date and remarkably free from errors. While in no sense a text-book it will be an invaluable vade-mecum for veterinary surgeons in all branches of the profession in New Zealand and for students. It will also be useful to many outside New Zealand who require to know the incidence of disease in that country. References are given only where a good recent review or other suitable paper is known.

The index is a detailed one but the method of presentation could be improved as it fails to make sufficient distinction between main and the sub-heads which can be misleading until one gets used to it.

The binding is good and the print very clear and easy to read. An astonishing amount of accurate and useful information has been compressed into 232 pages.

The copy available for review seems to be incomplete as it does not contain the eight appendices dealing with legislation which are listed in the table of contents.

One feels that other countries will be likely to follow the example which has been set by the Technical Committee of the New Zealand Veterinary Association. Much hard work must have gone into this and the Technical Committee is to be congratulated on the success achieved.

SMYTHE, R. H. [Examiner in Surgery to the Royal College of Veterinary Surgeons.] (1958). **Veterinary ophthalmology.** pp. viii+379. London: Baillière, Tindall & Cox. 2nd Edit. 42s. **2710**

This second edition differs little from the 1956 edition [*V.B.* **26,** 2763], but ten pages on congenital abnormalities of the eye have been added.—R.M.

BARGER, E. H., CARD, L. E. & POMEROY, B. S. (1958). **Diseases and parasites of poultry.** pp. 408. London: Henry Kimpton. 5th Edit. 37s. 6d. **2711**

This well-known text-book has long been popular with those seeking a source of information on the diseases of poultry at a medium price. For a book of this type to have reached its 5th edition, in addition to seven reprintings, in the course of 23 years, proves that it must have satisfied the needs of its readers, and is an indication of the rapid advances made during recent years in the study of avian diseases.

Dr Pomeroy of St. Paul, Minnesota, has joined the original authors and the emphasis, stressed in the preface and apparent throughout, is on the overriding importance of a suitable environment and of good management in the maintenance of healthy poultry. The value of new medicinal agents is not overlooked but they are rightly not regarded as substitutes for sound management. This book, however, is not written primarily for veterinarians and those hoping to find details of dosage of drugs for treatment and prevention, even of certain of the common diseases, will have to look to the more comprehensive text-books for guidance.

Several diseases which have attained prominence in the last few years receive mention, but the book is concerned almost entirely with its subject as seen from the American point of view. The contributions of British and other European workers on a wide range of subjects are almost completely ignored. It is no doubt difficult in a book of this size to decide what must be omitted, but it is wrong to give the impression that advances in poultry science are confined to the New World when the book itself has a universal appeal.

The extensive lists of references at the end of each chapter, which have always been a feature of his book, add considerably to its value.—J. D. BLAXLAND.

ANON. (1958). **New and nonofficial drugs. Containing descriptions of therapeutic, prophylactic and diagnostic agents evaluated by the Council on Drugs (formerly, Council on Pharmacy and Chemistry) of the American Medical Association.** pp. xxx+645. Philadelphia (& Montreal): J. B. Lippincott Company. London: Pitman Medical Publishing Co. Ltd. 30s. **2712**

This annual publication contains monographs on drugs that have not been included in the Pharmacopeia of the United States or the National Formulary. They are grouped according to their field of action, and full details of each drug are given under the headings action and uses, dosage and commercial names and preparations. It differs from the United States Dispensatory in concentrating on new drugs, and is therefore much less bulky and a more convenient guide to current therapy. All the drugs included have been evaluated by the Council of Drugs of the American Medical Association. There are no references to the veterinary use of the substances mentioned.

—R.M.

HARRINGTON, G. (1958). **Pig carcass evaluation.** pp. xi+107. Farnham Royal: Commonwealth Agricultural Bureaux. 15s. [Technical Communication No. 12 of the Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh.] **2713**

This review describes and compares the different techniques in assessing the quality of pig carcasses. It is intended to be the first of a series of reviews on pig carcass quality. Other authors will deal with genetic and environmental influences.—M.G.G.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

ALSTON, J. M. & BROOM, J. C. (1958). **Leptospirosis in man and animals** pp. xii+367. Edinburgh (& London): E. & S. Livingstone Ltd. 40s.

BISHOP, M. (1958). **It's a dog's life.** pp. 224. London: Hammond, Hammond & Company. 12s. 6d.

CLIFTON, C. E. (1958). **Introduction to the bacteria.** pp. xiv+558. New York (Toronto & London): McGraw-Hill Book Company, Inc. 2nd Edit. 58s.

HUTT, F. B. (1958). **Genetic resistance to disease in domestic animals.** pp. xii+198. Ithaca, New York: Comstock Publishing

Associates. [A division of Cornell University Press.]

VAN RENSBURG, S. W. J. (1957). **Breeding problems and artificial insemination.** pp. 249. Pretoria: Libagric. 28s. 6d.

ANON. (1957). **The indigenous cattle of the British dependent territories in Africa. With material on certain other African Countries.** pp. xviii + 185. London: H.M. Stat. Off. 30s. [Colonial Advisory Council of Agriculture, Animal Health and Forestry Publ. No. 5.]

SPRINGER, G. F. [Edited by.] (1957). **Polysaccharides in biology. Transactions of the Second Conference, April 25, 26 and 27, 1956, Princeton, N.J.** [Sponsored by the Josiah Macy, Jr. Foundation.] pp. 245. New York: Josiah Macy, Jr. Foundation. $5.00.

ANON. (1958). **Diseases of domestic animals in New Zealand. (Prepared by Technical Committee, New Zealand Veterinary Association, Inc.)** pp. x + 240. Wellington: Editorial Services Ltd. 35s.

Printed in Great Britain by CHARLES BURRELL & SON, Chertsey Surrey.

CONTENTS

INDEX TO AUTHORS

ERRATA

V.B. 28, abst. 1751. In title translation, for "Macdonia" please read: Macedonia.

abst. 1856. Title line 3. For "deficiences" please read: deficiencies.

abst. 2206. Title line 2. For "diagnosiis" please read: diagnosis.

FORTHCOMING CONGRESSES

XVIth INTERNATIONAL VETERINARY CONGRESS, Madrid, 21–27 May, 1959
Congress Secretary: Dr. Pedro Carda, Villanueva 11, Madrid, Spain.

THIRD WORLD CONGRESS ON FERTILITY AND STERILITY, Amsterdam, 7–13 June, 1959
Congress Secretary: Dr. L. I. Swaab, 4 Sint Agniestraat, Amsterdam-C., Netherlands.

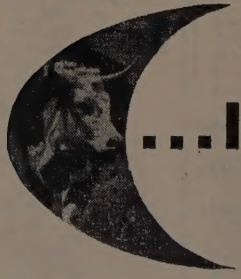
for 'field' use . . .

Photograph by courtesy of Farmer's Weekly

. . . INTRAMYCETIN

A new form of
CHLOROMYCETIN *in aqueous suspension for intramuscular use*

Easily taken into the syringe. Requires no mixing or preliminary manipulation.



. . . INTRAMYCETIN*

Ready-to-use Broad Spectrum Therapy

Rubber capped vial containing 10 ml. suspension equivalent to 1½ g. Chloromycetin.*

*Trade mark

PARKE, DAVIS & COMPANY LTD (Inc. U.S.A.)
HOUNSLOW · MIDDLESEX.
Tel: Hounslow 2361
1014